THE PAPER INDUSTRY

A MONTHLY EDUCATIONAL JOURNAL JANUARY, 1933

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25 Years
This 110 H. P. Link-Belt Silent Chain Beater Drive, installed in 1908, is now in its 25th year of service, "with only ordinary operating care."
—Neenah Paper Company, Neenah, Wisconsin
This record speaks for itself. Link-Belt Silent Chain is the efficient, positive power transmission that has served the industry for years. When enclosed in our improved "Leak-Proof" casing, the result is an ideal drive. Catalogs.
Link-Belt Positive Drives Include:
Silent Chain Drives . . . Roller Chain Drives . . . P. I. V. Gear (Positive, Infinitely Variable Speed Transmission) . . . Worm Gear Speed Reducers . . . Herringbone Gear Speed Reducers . . . Chain Drives of all types (Mall. Iron, Promal or Steel) . . . Herringbone Gears . . . Flexible Couplings.
LINK-BELT COMPANY
Chicago • Philadelphia
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LINK-BELT
SILENT CHAIN DRIVES
4661

NON-CLOGGING

STOCK PUMP

CAN NOT AIR-BIND

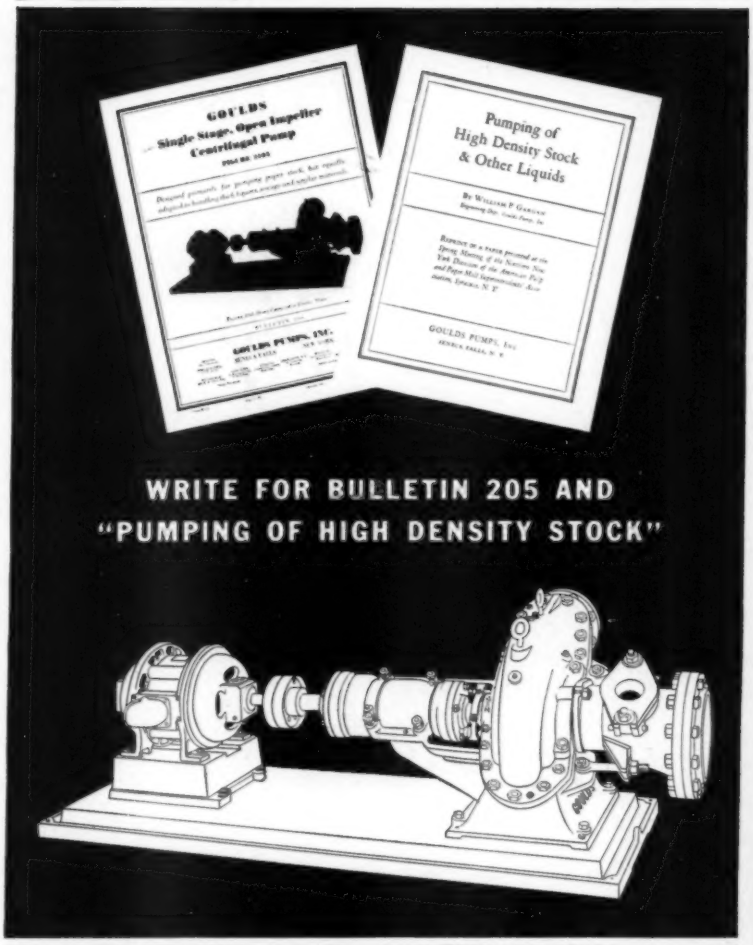
A STOCK PUMP has one job that it must do . . . deliver stock without interruption. To do this, the pump must: (1) not clog, (2) not air-bind.

Performance in dozens of mills, in all parts of the country, using all kinds of stock, prove that Goulds Stock Pump meets these requirements. It is pumping sulphate, ground wood, sulphite, reclaimed paper, wall board, rag stock for leading manufacturers.

Although these pumps have been operating on stocks running in density up to 8%, we have not received one complaint. And with good reason! The pumps are built so that they can't clog, can't air-bind!

Clogging is impossible with Goulds two-vane, open type impeller, especially designed to provide positive, even flow and to prevent water separation (common cause of clogging). Air-binding is eliminated by making the pump-discharge horizontal and placing it at the top of the casing, leaving no place where air can collect in pockets.

Development of this pump is a typical result of Goulds research. This research has been intensive in the paper industry. It is a constant part of Goulds practice. It costs over $1500.00 a week. To buyers who seek reliability, durability and economy of operation, it is a constant promise of better and better performance. Goulds Pumps Inc., Seneca Falls, N. Y. Branches and agents in principal cities.



WRITE FOR BULLETIN 205 AND "PUMPING OF HIGH DENSITY STOCK"

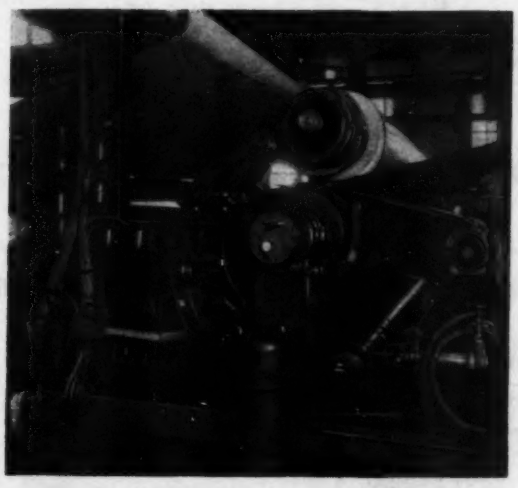
$1500 A WEEK FOR BETTER AND BETTER PERFORMANCE

GOULDS

PUMPS

This mill increased production up to 68%

READ THIS LETTER ⟶



They Expect to Do Even Better

HERE'S WHAT HAPPENED:

Increased Production 35% to 68%
Tripled felt life
5.6% Drier Paper

There's a reason. Ask Beloit.

The *Beloit* Way is the *Modern* Way

BELOIT IRON WORKS, BELOIT, WIS., U. S. A.

The BELOIT

BELOIT IRON WORKS PAPER MACH'Y BELOIT WIS

"Due to present market conditions and business in general it is only natural that this is considered a very poor time to spend money for new equipment, but, nevertheless, I believe that it is by far the best time for the purchase of Beloit Suction Rolls. In order to give you just reasons for my above assertion I wish to submit the following:

"Taking four of our major weights we show an increased production of from 35% to 68%.

"We have increased the life of our wet felts from seven to twenty-one days. The suction roll also reflects in a saving of coal due to the fact that our sheet leaving the former plain press was 30.5% dry while leaving the suction press is 36.1% dry.

"The above performance should be a satisfactory inducement for anybody using a plain press or inferior suction press to adopt a Beloit roll particularly during this depression in order to aid them in bringing about a satisfactory solution of these trying times.

"As yet I am not satisfied that we have gone the limit in increased production and lowered costs, due to the aid of this roll, as at this writing we find we must make a few minor alterations to the head box, then I am sure we will be able to show a still further increase in the efficiency of this roll.

"To mention that we are very much pleased with this installation would be entirely unnecessary."

THE PAPER INDUSTRY

JANUARY, 1933
Vol. XIV—No. 10

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry

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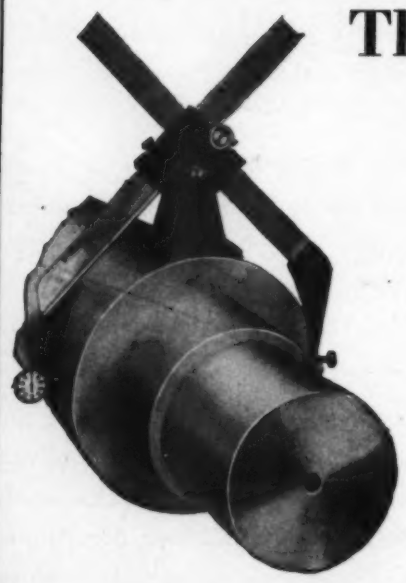


This "Precision Instrument"
—soon pays for itself

Regardless of whether the Paper Mill is or is not equipped to re-grind their own Calender Rolls—the Lobdell Improved MICROMETER ROLL CALIPER is an "indispensable instrument"—because it enables the mill to keep a CLOSE CHECK on the condition of their Rolls, and thus saves Time, Trouble and Money—and in addition, it assures them of a uniformly finished product (minimizing rejections).

The LOBDELL ROLL CALIPER is Light, Accurate and Easily Adjustable—and is immediately available for roll diameters 7" to 30" and 8" to 36", IN ONE INSTRUMENT. For larger diameters, special Calipers can be promptly made to order.

"Send for Literature"

OTHER LOBDELL PRODUCTS:
Automatic Roll Grinding Machines
"Puraloy" Chilled Iron Calender Rolls
Complete Calender Stacks

LOBDELL
CAR WHEEL COMPANY
96 Years in Business
WILMINGTON·DELAWARE

THE NAME

Taylor

NOW IDENTIFIES OUR COMPLETE LINE OF PRODUCTS, INCLUDING *Tycos* INSTRUMENTS

As of January 1, 1933, the Taylor Instrument Companies will generally replace the name Tycos with that of Taylor.

After that date, new types and designs of Taylor Instruments as well as containers, descriptive material and advertising will carry the name Taylor. Tycos-marked instruments, with a few exceptions, and Tycos material produced prior to that date, for sale during the year 1933, will carry our label stating, "The Name Taylor Now Identifies Our Complete Line of Products, Including Tycos Instruments," until their inventory is exhausted.

We consider it advisable to use one general trade name in place of two in the future to avoid any misconception about the uniform quality of Taylor products. This is a change long anticipated as a result of the continued growth of the Taylor Instrument Companies. It must be immediate in view of our plans to bring out new items and to start the most extensive advertising promotion ever undertaken by the Taylor Instrument Companies.

A recent survey of the United States convinced us that the name Taylor, placed on our products for homes, trade, professions and industries, will best represent the high standard of quality and accuracy established by the Taylor Instrument Companies through more than eighty years of business life.

President

Taylor Instrument Companies

ROCHESTER, NEW YORK

Taylor INDICATING, RECORDING AND CONTROLLING INSTRUMENTS

1900 year old speculation solved at last

For almost 1900 years musicians have speculated as to the tune which Nero played while Rome burned. A musical score, recently unearthed in an Eskimo Igloo, shows it to have been "There'll be a Hot Time in the Old Town Tonight." The paper is in a remarkable state of preservation. Ditch diggers estimate it to have been made with Hamilton Felts.

The present perfection of paper making owes much to Hamilton Felts.

Let's see. The first Hamilton Felt was made late in the Pleistocene Age, around 1858 A. D. It was made by two men, Asa Shuler and J. W. Benninghofen. The sons and sons' sons of these men are still making Hamilton Felts.

As a result, Shuler & Benninghofen know how to make good felts. This "knowing how" shows itself in the choice of wool, the methods of carding, of spinning, of weaving, of fulling, and of finishing. All of these in combination result in more than ordinary life to the felt and more than usual value to the paper.

Moreover, as a result of this experience, Shuler & Benninghofen know the practical application of felts to the various paper-making processes, resulting in a felt for each particular purpose that does its job uncommonly well.

Try a Hamilton Felt. Wherever a paper-making felt is used, there's a Hamilton Felt that will do it better.

SHULER & BENNINGHOFEN, Hamilton, Ohio
Miami Woolen Mills, Established 1858

Hamilton Felts

Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them.

PLAY *THIS* GREEN FOR GOOD RESULTS

PONTACYL Green BL Conc. is high in tinctorial power, brilliant in shade, and possesses good solubility. It is very suitable for calender coloring and dipping.

We could say lots more about this dyestuff, but the best way for you to know Pontacyl Green BL Conc. is to send for a sample and test it in your *own* mill.

Our Technical Service Department is always ready to cooperate in solving any of your dyestuffs problems.

DU PONT DYESTUFFS
REG. U.S. PAT. OFF.

E. I. DU PONT DE NEMOURS & COMPANY, INC.
Dyestuffs Division, Wilmington, Delaware
SALES OFFICES: Boston, Mass., Charlotte, N. C., Chicago, Ill., New York, N. Y., Philadelphia, Pa., Providence, R. I., and San Francisco, Calif. Represented in Canada by Canadian Industries Limited, Dyestuffs Division, Beaver Hall Building, Montreal, Quebec, and 372 Bay Street, Toronto, Ontario

THE STORAGE AND HANDLING OF LUBRICANTS

MONOGRAPH NUMBER 9

TO SECURE the full lubrication efficiency of high quality lubricants, it is essential that they be applied in the same uncontaminated condition in which they are received from the refiner. This requires proper methods of unloading, storing and dispensing.

Type of Storage

Whether to provide tank car storage, store oil in barrels or store it in dispensing equipment will depend upon the following conditions:

1. Amount of lubricant used per year.
2. Daily consumption of lubricant. If large, could daily or weekly shipments in barrels be more advantageously employed than tank car shipments.
3. The character of the lubricant.
4. Storage space available.
5. Availability of steam for cold weather unloading.
6. How lubricant is dispensed.

Tank Car Storage

Tank car storage should be employed only where the quantities of lubricant are large. Otherwise the investment in storage tanks, pipes, pumps and the oil itself will outweigh any savings that might be effected. Gravity unloading from both the tank car and the storage tank will reduce handling costs. Storage should be so located that the oil may be heated for transfer from the tank car to the storage tank in cold weather. In addition, the storage tank must be provided with heating facilities for cold weather dispensing, or the oil barrelled off before cold weather, which will increase handling costs considerably. Very viscous products seldom are adaptable to tank car storage due to handling difficulties. Where handled, it may be necessary to provide heated storage at all times.

Barrel Storage

This is the most common type of storage and to make it effective certain precautions should be observed.

Wherever possible barrels should be stored indoors where they are not subject to wide variations in temperature in order to avoid "breathing," which is one of the more common sources of moisture contamination. Inside storage also prevents the name of the lubricants from becoming obliterated, thus keeping the packages properly identified at all times. Heated storage, or rooms where lubricants may be heated before dispensing, may be necessary for viscous oils. Greases should at all times be protected from extremely high or low temperatures.

Where it is necessary to store barrels of oil outside they should be provided with as much shelter as possible and stored on their sides with the bungs up.

In all cases, and this applies especially to grease, old stock should be used first. Keeping a minimum of stock on hand also greatly facilitates keeping stock fresh.

Dispensing Equipment Storage

In steam turbines, and in large circulating systems and dispensing equipment of large capacity, it is often possible to time the ordering of oil so that when received it may be immediately transferred to the system or dispensing tank. This reduces handling, avoids the chance of contamination during storage and keeps inventory to a minimum. It is only feasible, however, when the consumption can be accurately predicted and deliveries quickly made from local warehouses.

For storage tank fabrication sheet iron or steel are satisfactory materials but galvanized tanks should not be used, due to possible reaction with oil, especially a compounded oil. Storage in oil room or at dispensing locations in the plant should preferably be in tanks or barrels equipped with pumps so arranged that dirt cannot get in nor any oil be poured back into the container.

Barrels may be equipped with faucets, but care must be exercised to avoid wasting oil and allowing the vicinity of the storage container to become dirty.

Handling

All transfer equipment, such as fill pipes, funnels and pipes should be perfectly clean before use.

Tanks, fill pipes, dispensing pumps, etc. should be plainly marked at all inlets and outlets with the proper markings to eliminate, as much as possible, any chance of contamination due to filling the container with the wrong material, or from using the wrong lubricant. An added precaution often employed is to paint dispensing equipment, such as pumps, pipes, oil cans, etc., a distinctive color for each type of lubricant. This is especially helpful in avoiding harmful contamination where two lubricants are similar in appearance but considerably different in performance characteristics.

Cleaning

Moisture formed during the breathing action of storage containers as well as small amounts of dirt that get in from time to time must be removed periodically before they accumulate to such an extent that they will reach the suction discharge or draw-off pipe, which should always be located several inches from the bottom of the tank.

All storage tanks should be equipped with manholes or other suitable openings to allow thorough cleaning. Small test cocks located at the lowest point in the tanks, or at a level slightly lower than the discharge pipe, aid in readily checking the amount of contamination in the bottom of the tank. Where no bottom drain is available a small suction pump may be used to draw this material from the bottom of the tank.

Dispensing Equipment

Dispensing equipment should be so located that the proper lubricants can be secured with the least amount of effort. Hourly employees have a tendency to spend too much time securing lubricants if the distance is too great, while piece work operators are prone to neglect securing lubricants in order to save time.

In large plants the dispensing of lubricants may be economically handled by assigning one man, or more if necessary, to lubricate all equipment, or to dispense lubricants to the individual operators. A portable hand truck containing a supply of the various lubricants, oil cans, guns, fittings, spare lubricating devices, cans for waste oil, etc. is a distinct advantage in performing this work efficiently. It saves the time of the individual operators going to and from the supply room, effects a more positive distribution of the correct lubricants in proper amounts and insures a partial check on the efficiency of lubrication.

Supervision

To make this check more effective one man should be given the responsibility for correct lubrication of all plant equipment. Whether this will be an individual job or one in connection with other duties will be dependent upon the size of the plant and the nature and amount of equipment to be lubricated.

His duties would be to work out, with the aid of competent lubrication engineers, the type of lubricant required by each machine, the frequency of application, the amount to be used, the point of application and changing and cleaning periods. He would fix the responsibility for lubricating each machine, inspect equipment regularly to see that his instructions are being followed, arrange for the proper storage, handling and filtration equipment, determine the lubricating appliances necessary and keep an accurate record of lubrication costs. This supervision is sure to lower repair bills and cut lubrication costs.

There are many minor details that cannot be covered in a monograph of this length, but the importance of delivering the lubricant to a bearing in an uncontaminated condition can readily be seen and every effort should be extended to accomplish this important part of "efficient lubrication."

STANDARD OIL COMPANY (INDIANA) SERVICE

THE PACKING AND SHIPPING OF LUBRICANTS

A SMALL amount of contamination may seriously impair the lubricating qualities of an oil or grease, resulting in excess wear, loss of power, and possible shut downs. It is, therefore, of utmost importance not only to provide good storage and careful handling at your plant but also to be certain that all lubricants purchased are fresh and pure.

It is the responsibility of the refiner to see that lubricants reach the customer in an uncontaminated condition. The Standard Oil Company (Indiana) takes this responsibility seriously and employs numerous precautions to insure the purity and freshness of its oils.

Though a lubricant may have passed all of the required tests during its manufacture, it is again given a complete laboratory examination before it is shipped. All barrels, in which lubricating oils are shipped, receive three careful inspections before they are filled. Turbine oils, circulating oils, ice machine oils and white oils are shipped in sealed containers. Tank cars are thoroughly cleaned and inspected before they are filled. A sample of the lubricant is then taken from the bottom and top of the tank car and sent to the laboratory for complete analysis.

At bulk stations, the lubricants are stored indoors, away from any chance of contamination by dirt and moisture. There are seventy of these stations located in the territory of the Standard Oil Company (Indiana), which assures quick delivery and eliminates the necessity of a customer holding a large supply in storage at his own plant.

When you purchase lubricants of the Standard Oil Company (Indiana) you can be absolutely certain that they have the quality to give the required lubrication if correctly used, and that they come to you free of any contamination.

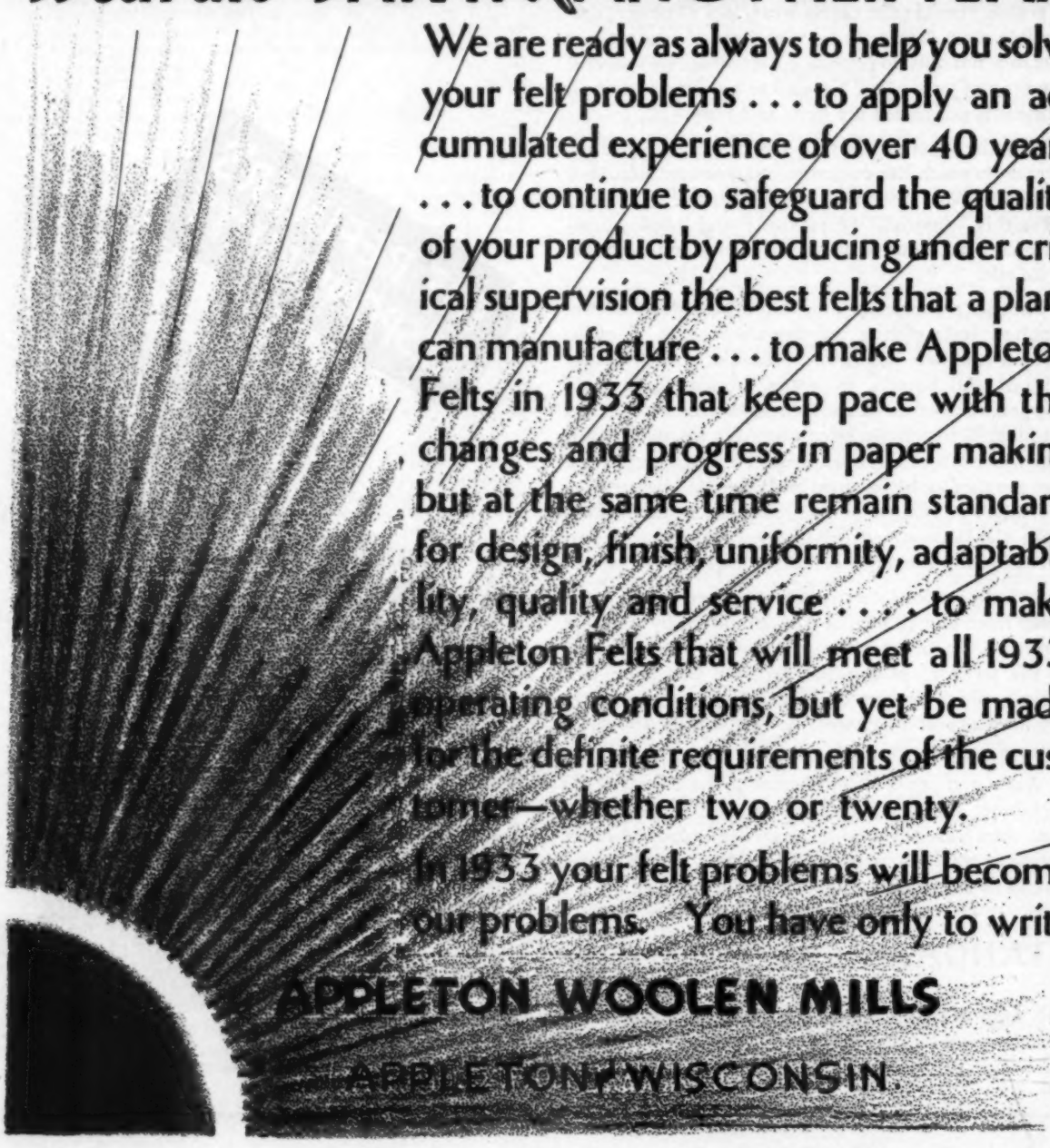
STANDARD OIL COMPANY
(Indiana) 1513

910 South Michigan Avenue Chicago, Illinois

If you do not have a complete file of all lubrication monographs, write for them Nine have now been published.

Appleton
Felts and Jackets

With the DAWN & ANOTHER YEAR



We are ready as always to help you solve your felt problems . . . to apply an accumulated experience of over 40 years . . . to continue to safeguard the quality of your product by producing under critical supervision the best felts that a plant can manufacture . . . to make Appleton Felts in 1933 that keep pace with the changes and progress in paper making but at the same time remain standard for design, finish, uniformity, adaptability, quality and service . . . . to make Appleton Felts that will meet all 1933 operating conditions, but yet be made for the definite requirements of the customer—whether two or twenty.

In 1933 your felt problems will become our problems. You have only to write

APPLETON WOOLEN MILLS

APPLETON, WISCONSIN.

A Happy New Year to You!

WE ARE wishing you a Happy New Year in all sincerity and in the belief that 1933 will see the beginning of a return of happy conditions to industry in the United States. The reason for our wishing you a Happy New Year is that we are convinced the only way happy conditions can return is through the medium of enlarged business activity.

Just ten years ago—in 1923—we witnessed the beginning of six years of the most magnificent wealth-producing prosperity the United States has ever known. It was the biggest, finest wealth-producing era ever known in any country at any time in the world's history.

For the six years inclusive—1923 to 1928—business in the United States embarked and progressed on the mass-production system.

By mass-production, we mean the producing of commodities for the masses by machines and the distributing of continuously increasing buying power to the masses for the period of six years.

However, in this six years, only 25 per cent of the machines in this country came under the mass-producing system, but the utilization of this 25 per cent was sufficient to demonstrate beyond any peradventure of doubt that in the mass-production system, lay the panacea for wealth-production in America.

What humanity can conceive and produce in one era of time, it can duplicate in another. That is a fact to be borne in mind.

In 1928, the circle of prosperity inaugurated and sustained by the operation of the mass-production system was broken. What happened, briefly, was this:

Mass-production needs mass-consumption, or better mass-purchasing power, to sustain it. To put it in the words that laymen can readily grasp, the production of goods for the masses furnished the masses with the purchasing power to continue the production of commodities. The mass-production period was the most successful living period and the most successful business period the country has ever known, judged by the results of earnings for both employers and employees. Mass-production has for its ultimate the producing of the largest quantity of goods, for the greatest number of people, at the lowest possible prices, at the best possible profit to all concerned. In 1928, the great mass of the purchasing power was diverted from the buying of commodities to the buying of equities—equities being defined as stocks and bonds in real and industrial estates. To illustrate:

In 1928, a certain typical family in the city of Chicago, four of whom were continuously employed and generously paid, owned their home without mortgage and were devoting their earnings to purchasing those commodities which enhanced their standards of living, improved their conditions and made for their comfort and happiness. Among other things, their old ice box had served its term. They needed a new one and they decided to purchase an electric refrigerator. They had the money, $300. About the time they had decided to purchase the refrigerator, a young man, an acquaintance of the family, took dinner with them and told of the fine financial "killing" he and friends of his were making by buying "Utilities." The result was they invested in "Utilities" and did not buy the electric refrigerator.

Now, multiply this instance by one million and the answer is: three hundred million dollars diverted from the purchasing of electric refrigerators into what

turned out to be worthless stocks. Then apply this same alienation of purchasing power to the automobile industry, radio industry, home buying and home furnishing industry, and one hundred other divisions of industry that suffered from this same alienation of purchasing power, and you have the answer to the great American depression.

For four years, the brains and ability of the country have been analyzing this new, strange and greatest of all phenomena. The American business man, producer and consumer have been thinking this problem through. During 1932, they have arrived at a conclusion: They see their error; they have repented of their wrong; they have girded themselves with a new determination to start up, re-instate and again pursue the mass-production system.

Nineteen Thirty-Three will witness that beginning just as ten years ago we saw its initial inception in this country.

The skeptic says: "How on earth are we going to start it?"

The answer is: through balancing our commercial budget. We have balanced our supply to our demand. The fact of the matter is that at this very writing, the supply of standard commodities is probably materially under the normal demand, and by normal we mean to-day.

We are about to witness a resumption and replenishment of all kinds and character of supplies. The supply is not available. The result is that early in 1933, we will witness a change in commodity prices—they will begin to ascend. A constant demand larger than the increasing supply can ever fill will become apparent. Trade will change from a buyers to a sellers market. Industry will charge consumers profitable prices for the goods they consume and the mass-production system thus re-inaugurated will return happy living conditions to America.

Quod erat demonstrandum!

A Happy New Year to You!

The Paper Foundation at A Century of Progress

THE year Nineteen Thirty-Three has ushered in a reign of hopeful expectancy—a greater assurance of better times than we have experienced during the past three years.

Notwithstanding the chaotic conditions of our country and the world at large, the faith of industries and nations in the survival and permanency of business has held fast. Thus supported, a great exposition has come steadily and surely into being, and on June 1, less than five months hence, A Century of Progress will open its gates on the lake front in Chicago, inviting and welcoming the public to witness what will be the greatest exposition of all time—a magnificent pageant staged in commemoration of one hundred years of the earth's progress.

Previous movements for participation by the paper industry in this great and important event have been unsuccessful, but a new organization has been launched and is pursuing a constructive plan which seems to assure an exceptionally fine exhibit by this essential and seventh-ranking industry.

This new body is known as The Paper Foundation, organized not for profit, with offices in the Conway Building, Chicago. Control is vested in a Board of Governors, and Phil. A. Howard, publisher of The American Paper Merchant, has been selected as managing director. Under his leadership, a nation-wide drive is being conducted for funds to assure a composite exhibit of paper and paper specialty products at the exposition.

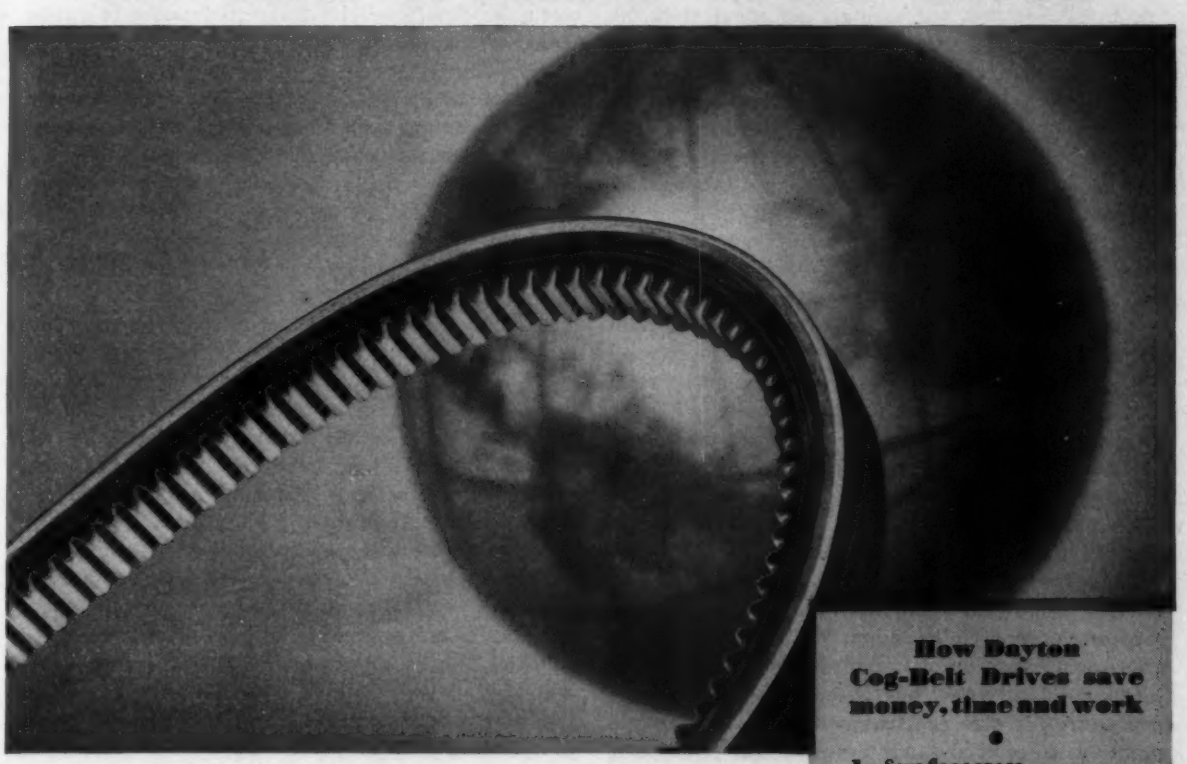
It is proposed to secure the widest possible range of subscribers with the hope that two thousand or more units of the paper industry will participate. It is estimated the total expense of the exhibit will be around $60,000.

Space for this exhibit has been secured in the Graphic Arts Division of the General Exhibits Halls, which buildings are already completed. Here will be portrayed the story of paper and its technical development, in connection with which a miniature paper machine will be operated. The exhibit will also show the industrial, commercial and domestic uses of paper.

It has been estimated that fifty million people will attend A Century of Progress which will be open to the public from June 1 to November 1. Those in charge of the paper exhibit are convinced that a co-operative effort by all divisions of the industry will bring to fruition the greatest opportunity ever presented for contact with millions of users of paper.

The Board of Governors of The Paper Foundation is composed of: H. R. Knott, president Salesmen's Association, of the Paper Industry; A. C. Gilbert, president Gilbert Paper Company, Menasha, Wisconsin, representing the American Paper & Pulp Association; W. N. Gillett, president Chicago Paper Company, representing the Western Paper Merchants' Association; D. F. Peck, president Hanchett Paper Company, Chicago, representing the Chicago Paper Association; Allen Abrams, president the Technical Association of the Pulp and Paper Industry, to represent that group; Fred C. Boyce, vice president Wausau Paper Mills, Brokaw, Wis., representing the American Pulp and Paper Mill Superintendents Association.

ONLY *ONE* V-BELT DRIVE IN THE WORLD LIKE THIS



Patented construction of Dayton Cog-Belts gives outstanding advantages

Here are some quick facts for quick reading about Dayton Cog-Belts—facts verified by leading engineers in a "thousand" different industries.

These Belts are utterly different from any other made. They're built to bend. The patented cog section and laminated construction enable Dayton Cog-Belts to flex naturally and easily around even the smallest pulleys—without distortion, buckling or rippling. This permits shorter center-to-center couplings and saves valuable floor space.

And since the sides are die-cut—not molded—Dayton Cog-Belts have greater gripping power at any speed. There's no slipping or sliding—less tension is required—and there's less wear on bearings.

Furthermore, the "stretch" is removed in the process of manufacture—adjustments are seldom necessary. And a patented reinforcement gives extreme crosswise rigidity which prevents squashing in the pulley grooves. *Thus the Dayton Cog-Belt is the only V-Belt combining maximum flexibility and crosswise rigidity.*

In addition to providing these numerous operating advantages these exclusive and patented construction features are responsible for the longer life of Dayton Cog-Belts—belt replacement costs are often cut in half.

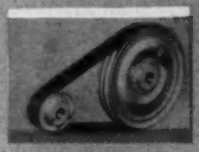
These are only the high spots. Send for information—without cost or obligation.

THE DAYTON RUBBER MFG. CO.
DAYTON, OHIO.
Factory Distributors in Principal Cities and all Westinghouse Electric and Manufacturing Company Sales Offices

How Dayton Cog-Belt Drives save money, time and work

1—Save floor space.
2—Built-to-bend—no distortion—no internal heating.
3—Greater gripping power—no slipping or sliding.
4—Stretch removed—fewer adjustments necessary.
5—No dressing or lubrication.
6—Less tension required—easy on bearings.
7—Longer life—belt replacement costs often cut in half.
8—Quiet—Clean—Rugged.

Complete drives—pulleys and belts—in stock. Fractional to 100 H. P.



Investigate the exceptionally low cost of Dayton Cog-Belts with

DAY-STEEL PULLEYS

Dayton

COG-BELT DRIVES

CURRENT THOUGHT

Is Filene's Plan the Way Out?

By WILLIAM SIBLEY

AS IT becomes increasingly apparent that the current depression will not end merely by the passing of time, more and more industrial and economic leaders are advancing plans and panaceas for recovery. Some of these have very evidently been conceived in haste and arranged in hysteria. Doubtless as the conviction that it is no longer safe to drift grows, many more plans will be offered.

Within the past two or three months, a number of restorative plans have been aired. Chief among these was the Reconstruction Finance Corporation fostered by the Government. Admittedly, this was a plan which forestalled many bank failures and made bank credit cheaper, but contrary to the belief of many when the Corporation was started, it did not contribute to the expansion of financial loans for constructive business enterprises, which was the only thing which could have been of restorative benefit.

Other programs and plans have failed to do even so much as the Reconstruction Finance Corporation. The program of public works, designed to furnish jobs to unemployed, collapsed in the pressure for governmental economy. President William Green of the American Federation of Labor advanced his plan for the thirty-hour week, but those who have delved deeply into his plan see that it is little more than a palliative, since it did not advance the purchasing power of the wage earning units.

Among those advancing plans for the revivification of business is Edward A. Filene, Boston merchant, philanthropist and student of economic trends. His proposal was published in the January first issue of the New York Times, and since it is a plan which is predicated on increasing the real wages of workers, I believe it worthy of quotation here. It has to do with establishing the thirty-hour week without decreasing the individual's total weekly earnings. But since every employer is more interested in cost-per-unit of production than in the numerical value of payroll, Mr. Filene's plan merits consideration. He says:

"Therefore I propose a trial period, during which the individual worker's pay for a thirty-hour week shall remain what it was for a longer week, with the understanding that the workers individually and collectively, shall attempt during that period so to increase their efficiency that the unit cost of the product will not rise. If at the end of this trial period (six, nine or twelve months) the unit cost has risen, wages shall be reduced until it is restored to its old level. If the unit cost thereafter drops, this pay cut shall be restored.

"Up to this point, management will have assumed two risks: first, it will have invested money in guaranteeing wages during the trial period; second, it will have produced goods in excess of the apparent demands of the market at the beginning of that period. Are these sound risks? In a single business which does not sell its products to its own workers they would not be. But if the plan were generally accepted by the key industries of the United States, I believe they would be. This will be seen if it is remembered that the wage earner is himself the market for the major portion of the nation's goods.

"The admitted hitch in this plan lies in its requirement of concerted action. But big business must lead the way if small business is to follow. But there is no reason why big business should not be expected to lead the way. It has become big business by leading the way. And we have a right to ask the competent to lead the way before the incompetent make a failure of an attempt.

"A minimum wage based on unit cost admittedly introduces a new element into the relations between labor and capital. It means that employers stop thinking of him as a producing machine and begin to think of him as a consumer. However, if evolution is to hold its own against revolution, the present system must somehow manage to transfer to labor some of the benefits of technological progress."

While Mr. Filene's statement that the "minimum wage based on unit cost . . . introduces a new element" is true, it is only partially correct. It is true only in so far as it puts every worker in the manufacturing establishment, whether the machinist, the beater-tender or the stenographer, on a collective piece-work basis. Wages on the basis of piece-work have been paid for years. Mr. Filene's plan, simmered to its essence, is merely that of putting the entire personnel on a plant-piece-work basis. If the employees do thus and so, collectively, they will earn their week's wage in 30 hours. If they don't, they won't. If they do more—they earn still more. Management has always been on a piece-work basis. Mr. Filene suggests that the entire working personnel be so arranged, collectively. He concludes his article in the Times by saying:

"This plan is not offered as a cure-all, though I do believe if it were adopted by the key industries it would at once relieve the present situation, and that if it became a settled policy it would prevent such situations from recurring in anything like the present severity. Like installment buying, it would expand purchasing power. Unlike installment buying, it would have elasticity without limit."

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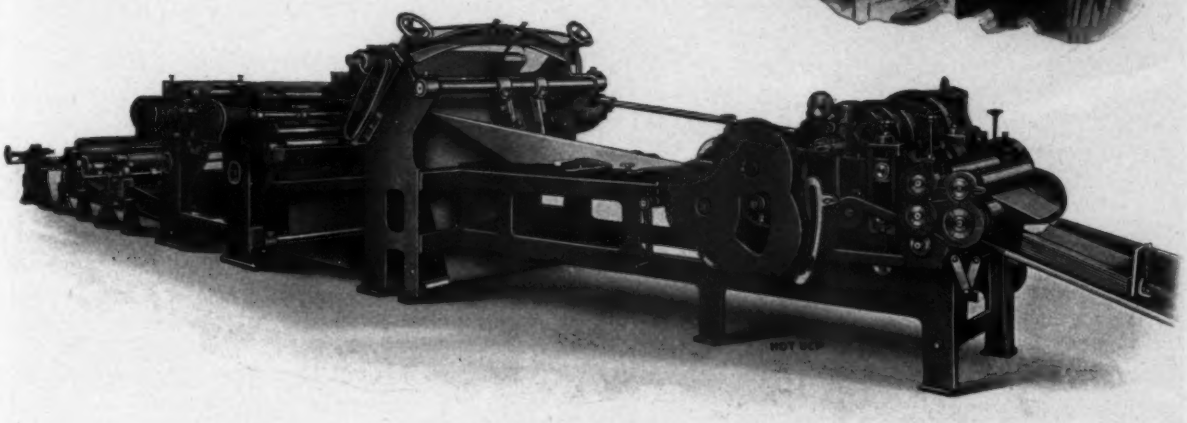

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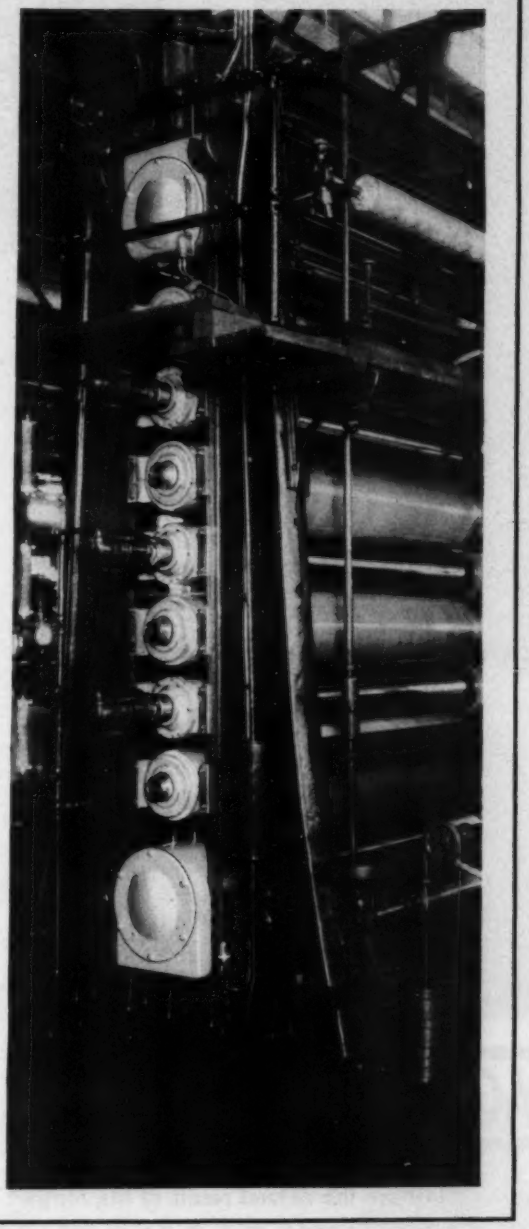

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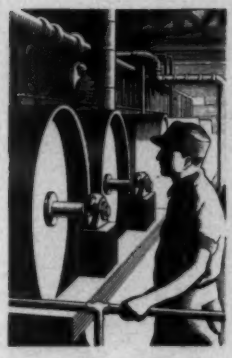

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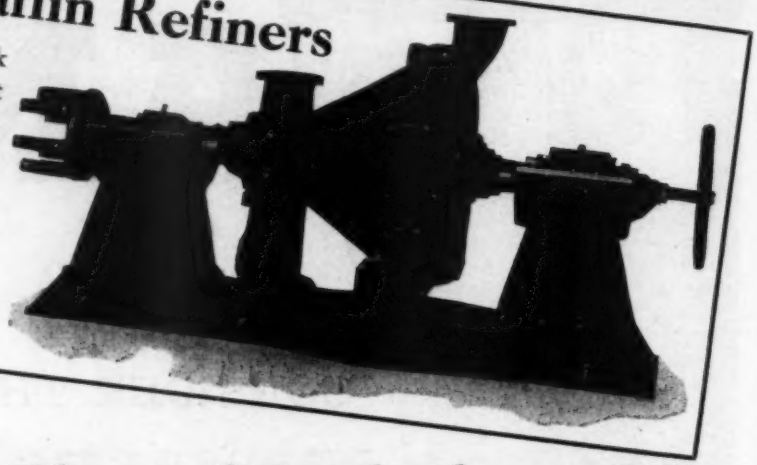

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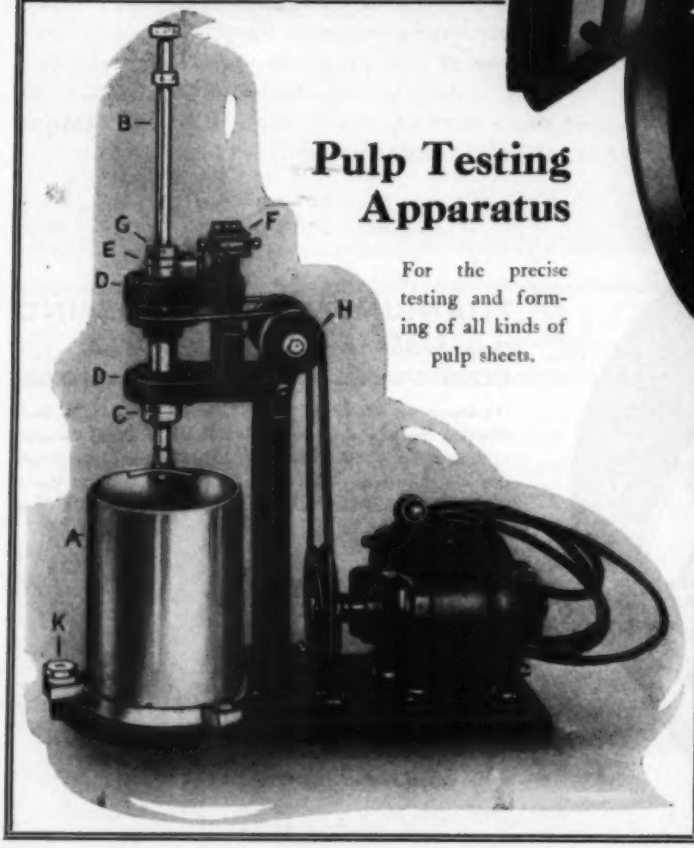

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THE PAPER INDUSTRY

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"Watchman Tell Us of the Night, What Its Signs of Promise Are?"

By "UNCLE JAKE"

J. Kindleberger, President
Kalamazoo Vegetable Parchment Company

THE watchman on top of the wall shouts through his megaphone to the sleepless and nervous questioner: "I detect faint but sure signs of the dawning of a new day. The darkness soon will be past!"

From the dawn of creation, day has always followed night. If this regular order of the universe ceases to function, your worries and mine will be over forever. Unfortunately, the disbursing of the business depression is not regulated by the tick of the clock. The change can come only by the will of man. No, not by might nor by power, but by the creation of the right spirit within him—the spirit that makes a man say, and mean it, "I will! I *will* master this adverse situation and no longer shall the situation master me!"

It was by this same spirit that the Israelites crossed the Red Sea. When they looked behind they saw the Egyptians coming after them, the desert on both sides and the Red Sea in front of them; by faith and with courage they started through the sea. After this display of self-help, the great God helped them by performing the well-known miracle of dividing the sea.

There is an excellent illustration in the parable of the Prodigal Son. Read on and you will see the point. The Prodigal, you remember, after his wild-oats-sowing spree, began to be in want; that is, his surplus dwindled to nothing. Finally he came to the point where he was willing and eager to accept anything. He long ago had stopped looking for a position, even stopped looking for a job. We find him begging from house to house—willing, yes glad, to do anything for a bite to eat. One farmer gave him the job of feeding the hogs, with the privilege of eating the same husks the hogs did eat.

At last this once rich and proud and worldly-wise boy landed at the bottom—the gutter. I saw him go down the road; you saw him go many, many times. You talked to him to try to persuade him to stop. He would not listen to reason. A smart boy was he!

This simple little drama is now being enacted in all our principal papermaking centers. If you will keep your seat just a little longer, the climax will come; the bottom, the gutter, will be reached; it is all prepared to receive the prodigals of a once-profitable business.

The Prodigal, in his wretched condition, looked at himself, made a self-examination and took an honest inventory of his assets. The ledger showed red! More red! Nothing but red! He faced utter annihilation. Something drastic had to be done and done quickly.

This Prodigal did what should and must be done by the modern prodigal in business. He said, "I will arise and go to my father." . . . . I will arise and go back to sound principles of business. I will know where the road leads before I take it. I will demand a fair profit. I will co-operate with others for the welfare of the whole industry. I will acknowledge my sins, my ignorance. I will turn over a new leaf, and more than that, I will put a brick on it so it can't fly back.

So my resolutions for the New Year are: As a buyer, I will stop lying about low prices that I can get elsewhere; as a salesman, I will stop depleting my company's treasury by giving away its surplus. Hereafter, I will avoid extremes which always lead to the bottom.

I will put these resolutions into effect at once, so help me God, to avoid utter demoralization to my business and myself by the same process that the Prodigal Son used. *I will!*

Then the watchman from his tower on the wall will take up his megaphone and cry aloud: "A new day is with us! The darkness is gone!"

Welding in the Paper Mill

By D. L. PELLETT
The Champion Coated Paper Company

WELDED construction can be applied to the fabrication of virtually all machine parts or structures. The advantages of the method become most apparent when welding is applied to the construction of heavy machines or machine parts that are built in relatively small quantities. Most of the equipment used in paper production is of such a nature.

Welding is more than a convenient repair method. It can be used as the routine method for the fabrication of new machines and experimental devices. Welded machines show unique advantages in development and research work. Units of this type can be easily altered in accord with changes made necessary by unexpected developments and new ideas. These alterations can be made with less delay and expense than would have been possible under older methods of construction.

Many hold to the opinion that a machine frame or base must be very rigid and that this rigidity cannot be secured with welded construction. Such an opinion can be questioned. Even the most rigid of bases will not have sufficient strength to withstand the virtually irresistible forces encountered in earth settling and building deflections. Other things being equal, the deflection of a loaded cast-iron member will be three times that of a steel unit, as deflection is in direct proportion to the elastic modulus of the material used.

If it is assumed that the efficiency of a machine part is a function of rigidity, then the theoretical relative costs of welded steel and cast-iron units is one to six. This ratio is based upon cast-iron having three times the deflection of mild steel and selling at twice the cost per pound. While this advantage is not obtained in practice, the ratio indicates the possibilities of the method.

Figure 1 shows a typical paper machine unit with welded steel frames. The machine is a four drum winder redesigned for welded fabrication. The main side frames of this unit were built of 20-inch "I" beams. These beams were split along the center of the web, a triangular section was burned out, and the web welded together to give the required slope. The vertical posts are 6-inch "H" beams. The cantilever slitter section is an 8-inch "I" beam supported by a one-half inch gusset plate. These frames are much more rigid, more compact, and were built with a saving in manufacturing cost of about 50 per cent as compared with cast-iron frames. This percentage does not include the savings in pattern costs (an important item when a single unit is being built), since these charges could be pro-rated over a large number of castings. It will be noted that the appearance of the completed structure is rather unconventional. However, the question of appearance is relative. The reaction of an observer will depend upon his background of experience and his faculty for accepting new standards of appearance.

Fig 1—Paper Machine Winder

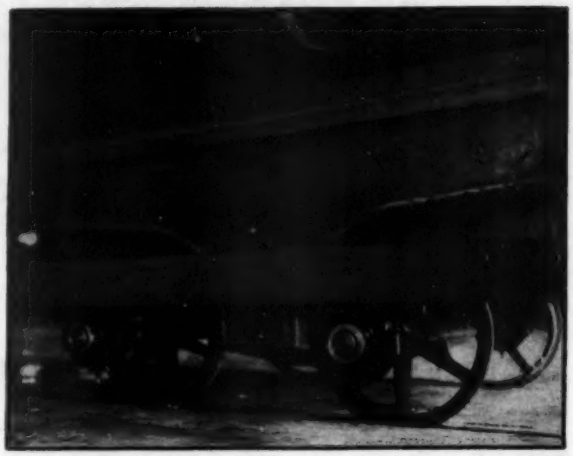

Fig. 2—Welded "weigh car" frame

Figure 2 serves as an additional example of a welded steel frame. This structure, the frame of a small weighing car, was designed to agree with accepted ideas concerning appearance. The completed structure bears a close resemblance to similar cast-iron units.

The structures thus far considered were built as single units. In these cases, the major saving was one of pattern costs. Welding, however, makes it possible to effect substantial reductions in material costs. For example: Six welded steel pebble mills of the type shown in Figure 3 were built by The Champion Coated Paper Company. In this case, the pattern costs would have been of relatively small importance if distributed over six units. Each mill, designed to carry a load of thirty-five tons including the weight of the shell structure and a lining of silica brick, has a drum ten feet long and seven and a half feet in diameter. The head rib plates are three quarters of an inch thick. The shell and head plates were torch cut from one-half-inch steel plate. A steel hub casting, serving as a trunnion for an anti-friction bearing, was joined to the center of each head plate. The casting on the driven end was bored for a drive shaft which was welded in place. Since

all torque is transmitted by the shaft welds, no keys were required. The stresses were carefully computed in all welds and loaded members. The maximum working stress in the ribs was assumed to be 8,000 lb. per square inch. This figure is based on a factor of safety of four for steel having a fatigue limit of 32,000 lb. per square inch. Welds in tension, compression and bending were stressed to 5,000 lb. per square inch; welds in shear were stressed to 4,000 lb. per square inch.

A pebble mill of conventional construction has also been operating in the mill of The Champion Coated Paper Company. This mill was built of semisteel head castings and a rolled steel shell plate. All joints were bolted or riveted. A cost comparison of this type of mill with that of the welded mill will serve as an excellent example of the benefits to be derived from welded construction. These comparisons are based on comparable wage scales and material costs.

Comparative Costs of Pebble Mill Drums

	Cast and Bolted Construction	Welded Construction
Labor	100%	45%
Material	100%	42%
Total Mfg. Cost	100%	43%
Material Cost / Labor Cost	3.01	2.77

These percentages indicate that welding resulted in about the same cost reduction for both labor and material on a percentage basis. However, since the material costs were about three times the labor costs in both cases, the saving in material is of much greater importance. The total cost reduction attributable to welding the six mills was about $7,000.

Fig 3—Head construction of an all welded pebble mill

The use of welded steel bed plates for motors, pumps, and speed reducers is too well known to require much discussion. This type of construction is one of the most useful applications of welding. Welded bedplates can be built at a reduction in manufacturing costs of about 60 per cent. The most common type is fabricated from channel irons and steel cross plates. The use of steel plates makes it possible to mount units on the base without any preliminary machining of pads or other mounting surfaces.

The guarding of gears, chains and short center belt drives is a prerequisite to safe and efficient machine operation. These guards can be easily built of torch cut, lightweight steel plates formed to the proper contours. A typical example of such construction is found in the dryer gear guards shown in Figure 4. The guards that these welded units replaced were of heavy cast-iron construction having a thickness in cross-section of about three-eighths of an inch. The new guards were built of one-eighth-inch steel plate. The material cost ratio for the two types of guards is about six to one in favor of welding. The labor costs are about the same in both cases. The time spent in welding sheet metal guards is balanced by machining time on the castings.

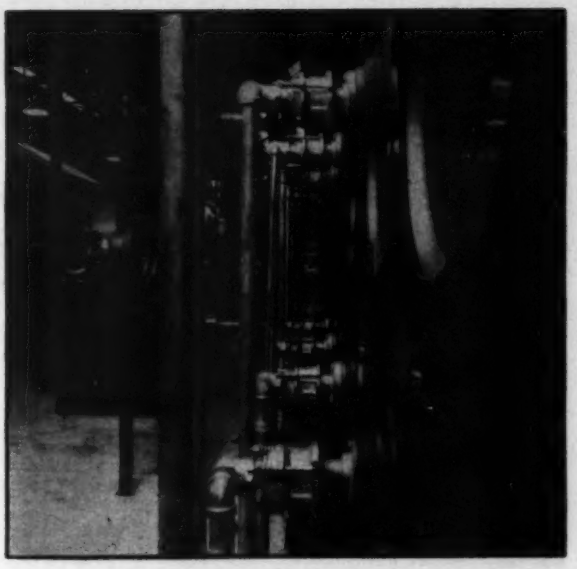

Fig. 4—Welded steel dryer gear guards

Welded steel rolls are among the newer applications of this method of construction. This type of construction has two primary advantages over cast-iron rolls: namely, lightness and rigidity.

The manufacture of certain classes of paper requires the use of very light pressures in the press section. It was found that these light pressures could not be obtained with a conventional cast-iron roll. An attempt was made to design a welded steel, top press roll, of very light construction. Figure 5 shows the type of structure developed. The roll was built of one-inch shell and head plates with cast steel journals. The roll in question was covered with three-quarters of an inch of hard rubber. The thin end diaphragms were added as a concession to appearance; their utilitarian value

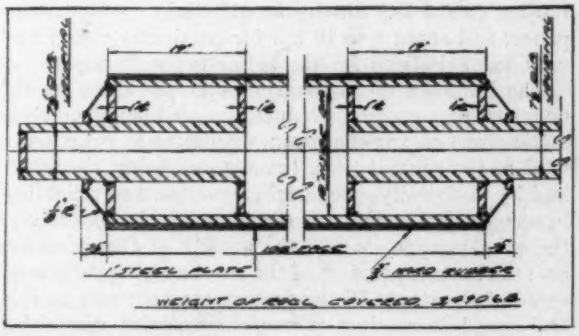

Fig. 5—Welded steel press roll

is doubtful. The total weight of a covered roll of this type with a 106-inch face is 3,490 lb. This is about one-half the weight of a cast-iron roll of similar dimensions.

It was originally intended that the welded steel press rolls should be operated without press weights, but it was found that these rolls gave satisfactory service when operated under full weights and pressure. Two welded rolls, similarly operated, showed no perceptible weld failures due to metal fatigue or other causes.

The success of the welded steel press rolls prompted the use of this type of construction for dryer felt rolls and similar applications. These rolls are quite light and relatively cheap. Machining the journals is the only machining operation required.

Much has been written during recent years concerning the technique of welding and the tests required to determine a good weld. This information has led to the belief that the production of high strength welds is beyond the scope of ordinary welding equipment. Such may be the case, but the construction of paper mill equipment does not require the production of welds having a high value of ultimate strength. In most cases, neither the welds nor the adjacent material are stressed to a high degree. This fact is due to the need for rigid structures rather than highly stressed lightweight structures. Most welding operators tend to apply a bead which is longer and heavier than needed. This tendency is an additional factor tending to reduce the working stress in the weld. If care is given to the design of a structure that can be fabricated without the introduction of internal strains, the failure of a welded structure will be a very rare occurrence.

Every builder of paper mill equipment has unique problems that can be solved by this method of fabrication, which when properly applied will pay substantial dividends in reduced manufacturing costs and increased operating efficiency.

Wood Pulp Grinding

Factors Controlling the Quantity and Quality

By W. G. HARRIS

THE invention of the continuous grinder opened up the way to the introduction of continuous methods of production in wood pulp mills from the wood to the finished paper, assuming that the uniformity and fineness of the grindings made the use of hollanders unnecessary. Careful planning of the work of a grinding mill is indispensable, however, in order that uniformity in the quantity and nature of the grindings, simultaneously with the uniform power consumption, should result. Not only the power absorbed by the grinder, but also the pressure of the wood must be kept constant, and must be accurately measurable at any time in order that irregularities may be detected at once.

A primary condition for the systematic operation of a grinding plant is a clear idea of the various factors on which depend the production of grindings and the power consumed, as well as the effects of stoppages which have to be compensated by regulating the feed. It is not possible to give accurate numerical values which are generally applicable as to the power required to produce a definite quantity of grindings. It may be taken as an approximate basis, however, that about 5 to 7 hp. will be necessary for the production in 24 hours of 100 kg. (220.5 lb.) air-drying grindings for newsprint paper, and about 8 to 10 hp. for particularly slow and very fine grindings for the better types of paper.

The influence of the sharpness of the stone on the quantity and quality produced is well known. Synthetic stone of various grain structures is principally used at the present time, these stones being characterized by uniformity, good grain structure and reliability in service. Primary factors influencing the economy of the grinding process and the quality of the grindings are: the contact pressure of the wood and the peripheral speed of the stone. With pressure constant and peripheral speed increasing, power consumption diminishes and production increases. At a peripheral speed of 8 m. (26.25 ft.) per sec., 10 hp. are required for producing 100 kg. (220.5 lb.) grinding in 24 hours, whereas at a peripheral speed of 20 m. (65.6 ft.) per sec., the power necessary is only 7.90 hp. The economy is 21 per cent, therefore, grinding should be carried out at as high a peripheral speed as possible, although this speed should not exceed 20 m. (65.6 ft.) per sec. in order not to overstress the stone. The load on the grinder and the quantity produced primarily depend on the wood pressure, the power consumption sinking with increasing wood pressure. Nevertheless, there is a limit in this case also, at a wood pressure of about 2 kg. per sq. cm. (28.4 lb. per sq. in.). At higher pressures, the fibers are overground, that is to say, they become crushed and shortened to an inadmissible short length.

Careful Fixing Avoids Jams

The position of the wood in the presses is of particular importance. Careless fixing results in trouble by causing inconvenient jams, so that in the case of grinders with several presses the pressure in the other presses is increased by the regulators, and the grinder motor continues to run under full load. The grindings, however, become coarser, so that the sorters and refiners are overloaded.

The Influence of Temperature

The temperature of the grindings also exercises a decisive influence on their quality. It has been found that by increasing the temperature from 18 deg. C. (64.4 deg. Fahr.) to 57 deg. C. (134.6 deg. Fahr.), the material being diluted 21 times, the breaking length of the paper increased from 2,400 mm. (7.874 ft.) to

3,850 mm. (12.631 ft.), and the elongation from 2.3 per cent to 2.9 per cent. However, where the temperature was further increased to 64 deg. C. (147.2 deg. Fahr.), the breaking length and the elongation dropped to 3,000 mm. (9.843 ft.) and 2.6 per cent, respectively. There is no object, therefore, in increasing the temperature of the grindings above 65 deg. C. (149 deg. Fahr.), in addition to which the stone is more liable to crack at the higher temperatures. It is of great advantage to spray the stone twice: as it leaves and before it re-enters the press casing. This prevents fibers and chips being carried with it from the trough and blocking the gap between the grinding surface and the press casing. The quantity, temperature and purity of water used for spraying are also important factors. Cold water is bad for the stone and also has an unfavorable effect on the ground fibers.

Supervising the Feed Is Important

The most important factor, however, is continuous supervision of the feed. If the feed is wrongly adjusted, the result is either that too much material is produced, which is at the same time too coarse, or too little material, which is both overground and too costly. In order to avoid this, sharpness of the stone must be controlled by observing the speed of the feed. The idea suggests itself in some direct indication as to the production and the quality of the product from the speed of the feed motor. In order, however, that the effects of stoppages may be compensated and the load on the grinder kept constant, the speed of the feed motor must be changed continuously and rapidly within very wide limits. Any attempt to estimate the hourly production on the basis of monetary values of these speeds would give erroneous results. In order to obtain an idea as to hourly production, it is necessary that the feed of the wood should be observed over a longer period of time. The customary registering apparatuses are certainly unsuitable, as their zig-zag recordings do not present the information required in a sufficiently clear manner.

In this connection, attention may be drawn to a feed meter designed by an engineer of the Haindl Paper Mills, Augsburg, Germany, which, based as it is on grinding practice, is particularly adapted to the purpose. The device consists of a counting mechanism which is driven from the shaft of the feed motor through a gear, although it can equally well be equipped for electric remote metering. This counting mechanism continuously registers the speed of the feed motor, and in addition moves a recording pen proportional to the speed of the feed of the wood. After ten minutes or less, the position reached by the pen is recorded on the registration strip. Simultaneously, the pointer is released and returns to the zero position and the recordings for the next period of time begin. The path covered by the pen represents the consumption of wood during that time or, with a suitable ratio of transmission and corresponding adjustment of the registration strip, the average hourly quantity of grindings produced, which bears a close relation to the condition of the stone and the quality of material produced. If the feed recorder indicates high production, this means that the stone is sharp and that a coarse wood pulp of poor quality is being produced. If, on the other hand, the speed of the wood feed falls below a certain value, this indicates that the stone is too blunt and requires sharpening, as it is again producing a material which is unsuitable for the production of paper. In addition, in this case, the power consumption rises above the admissible economic limit.

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Chart for Cuprammonium Viscosity of Rag Blends

By D. S. Davis
Dale S. Davis' Associates, East Northfield, Mass.

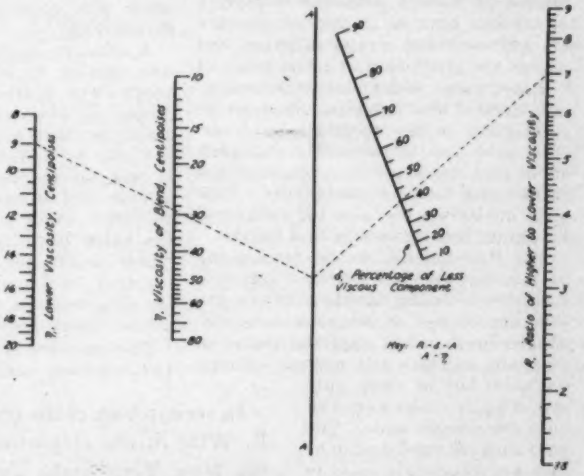
IN connection with their study of rag evaluation, Wennberg and Landt,[1] have shown that it is possible to calculate the cuprammonium viscosity of a binary rag blend when the percentage composition of the blend and the viscosities of the components are known.

A re-arranged form of the equation connecting the variables is: $\eta = \eta_1 R^{\frac{100-\delta}{100}}$

where: η — viscosity of the blend
η_1 — viscosity of the less viscous component
R — ratio of viscosities, higher to lower
δ — percentage of the less viscous component

in the blend, and where all the cuprammonium viscosities are in centipoises determined at 25 deg. C., by the Shirley Institute method.[2]

The equation is somewhat involved and can be handled most readily by means of the accompanying alignment chart. The broken lines serve to illustrate



the use of the nomograph and answer the question: What will be the cuprammonium viscosity of a blend made up of two rag stocks of viscosities of 63 and 9 centipoises when the percentages of the components are 60 and 40, respectively? The ratio of the viscosities, R, is 63/9 or 7 and, following the key, connect 7 on the R-scale with 40 on the δ-scale and note the intersection with the A-axis. Connect this latter point with 9 on the η_1-scale and read the viscosity of the blend on the η-scale as 29 centipoises.

[1] *Paper Trade Journal*, 93, 18, T. A. P. P. I. Section Page 202 (1931).
[2] Bertwell, Clibbens and Geake, *J. Textile Inst.*, 17, T145.

Paper Making Research in Russia and Sweden

A review of some recent works of their chemists and technologists

By LOUIS E. WISE, Professor Emeritus
New York State College of Forestry

IN MOSCOW, a publication masquerades under the formidable name of *Bumazhnaya Promuishlennost.* Better linguists than myself claim that this means The Paper Industry. In any event, this journal publishes promptly and fully the findings of pulp and paper mill technologists and chemists of the U. S. S. R. who seem to have entered this field with unusual energy and thoroughness. There are extensive searches under way for new cellulosic raw materials. European and American pulp and papermaking methods are being carefully studied and applied to meet new Russian conditions. And, what is far more important, the Soviet agencies are experimenting on their own and their work is both intensive and far reaching. Russia advertises the fact that she is in the paper business as a part of her vast attempt at rapid industrialization.

Karawajew and Kriwowjas,[1] some two years ago, reported on the utilization of Central Asiatic reeds containing 42 to 44.5 per cent cellulose in the production of soda pulp. In the Ukraine, where large pulpwood areas are rather scarce, straw has been an important raw material. To supplement this, Nerechosky, and later Resch and Orloff[2] have studied the use of tanbark, after the extraction of valuable tannins, in the manufacture of cardboard and wrapping paper and also in the production of a fair grade of bleached pulp. Ingeniously, these chemists utilized the sulphites obtained as by-products in the manufacture of carbolic acid and beta-naphthol, but they admit that the paper thus obtained was rather poor in color and quality. Tanbark utilization has also been explored by Chintschin, Rosenberg, and Larin.[3]

The accumulated waste (containing 51 per cent cellulose) from a series of factories producing tannin from tanbark oak approaches 30,000 tons annually. Studies were made, applying the soda, sulphate, sulphite and neutral sulphite methods, but of these only the sulphate cooks were run on a commercial scale. The pulp thus obtained had to be bleached cautiously so as to obviate loss in strength and the paper obtained was mediocre in quality. It should be noted that these were not haphazard attempts to exploit a new raw material. Tanbark pulps were compared carefully with those from Caucasian spruce and straw. Photomicrographs were made and ample physical and chemical data were collected.

There is no unanimity regarding the economic industrial application of certain Siberian aquatic plants found in the Ural district. Sobetowa[4] reports the availability of 100,000 tons of air-dried material per annum from the Cladophora and Rhizoclonium families. This is said to contain 30 to 40 per cent cellulose and to be suited to the manufacture of cardboard and felts. He also points out that in view of the high starch content the marine plants may serve as raw materials in producing ethyl alcohol. Perelkalski,[5] however, in reporting on Siberian seaweed *(Cladophora fracta)* gives a cellulose content of only 12.7 per cent and an unusually high ash, which would make the material unfitted even for roofings.

Besides these studies, we find many others. Maximoff[6] has investigated the use of cornstalks in making wrapping paper. A high grade of pulp from straw by the use of cold dilute caustic soda, followed by superheated steam and by final bleaching with low concentrations of hypochlorites by the Sudahov technique was obtained by Khazanov and Strunnikov.[7]

A similar successful delignification was applied to hardwoods by Eliashberg.[8] The application of the sulphite process to pine wood has been investigated by Soletschnik and Komaroff,[9] and also by Jakimansi.[10] Evidently it is best for the liquor to contain magnesium and it may be prepared from dolomite. Prior to the actual digestion, the chips were impregnated with the liquor at 110 deg. at two atmospheres pressure for 5 hours, and after the cook the pulp received a final treatment with dilute caustic soda.

The mechanical side of papermaking has not been neglected in the Russian journals. Critical studies have been made of the operation of paper machines (especially those in the Balakhninski and Kondopozhaskii newsprint mills). Articles dealing with the charging of digesters, maintenance of repair shop equipment and others that cannot be abstracted in brief, have been published. Altogether, the field is a live one. We are impressed with the vitality of the Russians, and while much of their work represents the application of previously developed methods, there is ample evidence of entries into new territory.

IN DECEMBER 1931, when the new Research Institute for Cellulose Technology and Wood Chemistry of the Royal Technical College was dedicated at Stockholm, Erik Hägglund stood at its helm. During the past decade, this distinguished investigator, teacher and writer has become a dominant figure in pulp and papermaking, not only among his fellow Scandinavians, but throughout the world. Hägglund's tremendous energy and skill, his tireless search into the mechanism of the obscure reactions taking place during the acid and alkaline digestions of wood, his insistence on critical experimental data, his noteworthy book *Holzchemie*, and his other incisive writings in German, Swedish, and Finnish technical journals have brought their merited reward.

We can only touch briefly upon some of the work emanating from the Stockholm laboratories during the past 18 or 20 months. Hägglund and his co-workers have made significant studies on the chemistry of the sulphite cooking process. Accumulating evidence[11] indicates that sulphite treatment involves the sulphonation of the solid lignin in the wood and the subsequent removal of the lignosulfonate by hydrolysis. Another function of the sulphite liquor is its attack on the non-cellulosic polysaccharides, in the wood which are converted into simple sugars. The sulphonation takes place early in the digestion.[12]

Above 100 deg. C. the sulphonic acid and the polysaccharides appear in the liquor in which the latter are hydrolyzed. When twice the usual amounts of lime and SO_2 were used, the pulp yields increased 10 per cent due to increased sulphonation during the first part of

In recognition of the outstanding work of Dr. Louis E. Wise in the Department of Forest Chemistry at the New York State College of Forestry, Syracuse University, a hand-illumined copy of a resolution by the faculty of the college has just been signed by each faculty member and forwarded to Dr. Wise.

Dr. Wise was Professor of Forest Chemistry at the New York State College of Forestry from 1919 to 1930. He resigned because of ill health. He is chiefly known for his work in cellulose chemistry, having instituted this course in 1920; the first of its kind in a forestry institution. Although no longer actively engaged in teaching or connected with any institution, Dr. Wise is continuing his research.

the cook. The higher yields are due not specifically to the lime but to the HSO_3— ion, since the substitution of equivalent amounts of $Mg++$ or NH_4+ in place of the $Ca++$, did not alter the results. Hägglund also found that simple sugars catalyze the decomposition of bisulphite, an excess of which is required to insure against blackened cooks. Substantiating the results of Kullgren, Hägglund[13] found that both sodium bisulphite and sodium sulphate favored delignification by means of SO_2. For example, digestions carried out in the presence of sodium sulphate at 135 deg. C. gave normal pulp with sulphurous acid yields of high quality. Those carried out with SO_2 alone or in the presence of NaCl resulted in blackened pulps. Even at 110-120 deg. C., salts were shown to have a marked influence on the hydrolytic action of the sulphurous acid—an effect coupled with the hydrogen-ion concentration. $NaHSO_3$ and Na_2SO_4 decrease the hydrolytic action. NaCl and $NaNO_3$ cause its acceleration.

Realizing the conflicting data in the literature on the hydrogen-ion concentration during various stages of the sulphite cook, Hägglund and Johansson[14] made a careful study of the intensity of acidity throughout the course of two digestions. In the case of an acid liquor containing 1.24 per cent CaO and 5 per cent SO_2, the acidity decreased slightly during the first four hours of the cook. It then increased slowly until at the end of 17 hours, the hydrogen-ion concentration was higher than in the original liquor. In another run, in which the liquor contained 0.8 per cent CaO and 5.05 per cent SO_2, the acidity also decreased slightly at first, then mounted very sharply. The authors determined the hydrogen-ion concentration by noting the rate of hydrolysis of starch under the influence of the sulphite liquor, and comparing the hydrolysis constants thus obtained with those found by the use of dilute, pure acids of known hydrogen-ion concentration.

That there is no advantage in using magnesium in place of lime in spruce sulphite pulp production was shown by Hägglund[15] by replacing calcium by equivalent amounts of magnesium in the cooking liquors. Magnesium bisulphite removes lignin less readily than does calcium bisulphite. The only advantage in the use of magnesium in the delignification of spruce lies in the increased sugar yields in the spent liquors, and is of interest only when ethyl alcohol production is involved. Under the usual conditions of sulphite digestion, 30-40 per cent of the sugars are so changed that fermentation is prevented. Hägglund's[16] investigations show that the bisulphite ion is responsible for the oxidation of these sugars to their corresponding acids (e. g. mannose to mannonic acid). The formation of cymene, the hydrocarbon always formed during the sulphite cook, is accounted for as an oxidation product of the terpenes originally present in the wood.

That the presence of Na_2S in the sulphate cook hastens delignification was shown by Hägglund and Hedlund.[17] With 16 per cent Na_2S (based on total alkalinity) the accelerating action is comparable to the effect produced by an increase in temperature of 7 to 8 deg. C.

Quite recently, Hägglund and Schollin-Borg[18] have shown that black liquor, when added to the usual white liquor in sulphate cooks, increases the speed of reaction, at least at the outset of the digestion. This, however, is contingent on maintaining an unchanged liquor ratio, and identical alkalinity and Na_2S content in the liquor, and applies to cooks in which spruce, *not pine*, has been used as raw material. Up to the point at which the black liquor comprises 50 per cent of the total solution, the yields, lignin content, and strength of the sulphate pulp remain largely the same as those found in pulps produced without the addition of black liquor. Higher percentages of black liquor however cause marked darkening and are impractical. By increasing the sulphide content from 16 to 29 per cent, pulp with increased folding endurance but with a slightly decreased tearing strength was obtained.

Black liquors,[19] heated in rotary digesters at 340-350 deg. C. at 190-200 kg/cc[2], were usually adequately carbonized in fifteen minutes. The following table gives a brief summary of the yields of by-products obtained from various cellulosic raw materials:

Black liquor from:	% Tar	% Methanol	% Acetone	% Acetic Acid	% Gas
Pine	25	2.5	..	5.6	4.5
Aspen	16	2.8	0.45	9.25	6.0
Beech	19	2.0	..	9.8	6.25
Birch	18	1.6	..	10.0	6.0
Rye straw	21	1.0	..	7.5	6.5
Esparto	17.5	1.5	0.5	8.0	4.0

When hydrogenated under pressure with a nickel catalyst, these tars yielded a mixture of saturated and unsaturated compounds, having an initial boiling point of 70 deg. C.

Comparative cooking experiments with 20 and 25 per cent caustic soda in the formation of kraft pulps from spruce and pine indicated that in order to obtain similar degrees of delignification the time of digestion must be extended when the weaker alkali is used. Under similar conditions of digestion, spruce yields stronger pulp than does pine. With decreasing alkali concentrations (which were never allowed to fall below 20 per cent) the tearing strength of the pulp increases while the folding endurance decreases. This was the work of Hägglund and Nyman.[20]

The above resumé of Swedish investigations deals largely with the work of a single laboratory, and even so it is far from complete. In fairness to other research men, it is well to warn the reader that other Swedish laboratories have been neither dormant nor inactive. We have only to mention the names of such chemists as Peter Klason, Bror Holmberg, Gösta Hall, and Gunnar Lundstrom among others to bring assurance that pulp and paper investigations are not confined to one institution. However, the preëminence of Erik Hägglund made a review of his work and that of his collaborators not only desirable but almost inevitable.

[1] *Papier-Fabr.* 28:654 (1930).
[2] *Bumazhnaya Prom.* 8/9:57 (1930).
[3] *Ibid.*, 8/9:68 (1930).
[4] *Ibid.*, 8: 22 (1931).
[5] *Ibid.*, 1: 37 (1931).
[6] *Ibid.*, 10: 25 (1931).
[7] *Ibid.*, 4: 47 (1932).
[8] *Ibid.*, 5: 21 (1932).
[9] *Mitteilungen forstl. Versuchswesen*, 19:9 (1931), through *Cellulosechemie*.
[10] *Bumazhnaya Prom.* 7:18 (1931).
[11] Hägglund, *Svensk Kem. Tid.* 44, no. 6:163 (1932).
[12] Hägglund, *Svensk Pappers-Tidn.* 34, no. 5:160 (1931).
[13] *Svensk Pappers-Tidn.* 34, no. 23:831 (1931).
[14] *Cellulosechem.* 13, no. 8:139 (1932).
[15] *Zellstoff u Papier.* 11:338 (1931).
[16] *Tek. Tid. Uppl. C. Kemi.* 62, no. 49:60 (1932).
[17] *Papier-Fabr.* 30:49 (1932).
[18] *Pappers-Trävarutid Finland* 14, no. 10:368 (1932).
[19] Hägglund, *Pappers-Trävarutid Finland*, 13, no. 11:508; no. 12:569 (1931).
[20] *Zellstoff u Papier.* 12:65 (1932).

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Schweitzer Makes Cigarette Paper from Domestic Flax

A new source of raw material in the United States for the manufacture of paper is being heralded, one which it is hoped will create a new industry for the South.

An interesting article written by Louis P. Schweitzer, manager Peter J. Schweitzer, Inc., paper manufacturer of Elizabeth, N. J., appeared in the November 24 issue of *Tobacco*. On October 7, the Schweitzer plant produced the first cigarette paper to be manufactured from American-grown flax, grown in the State of Virginia.

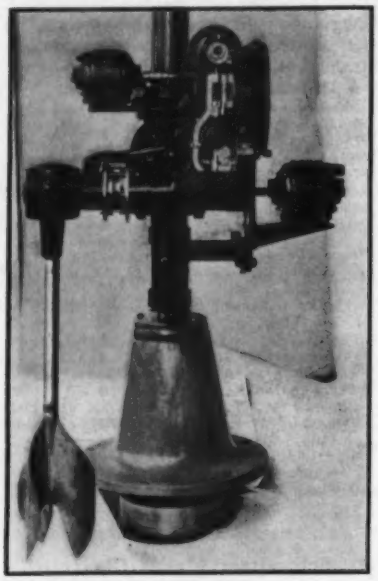
This development has a real significance, since the flax used for the manufacture of cigarette paper has been imported from other countries, principally from Russia. About 40,000,000 pounds of flax in various forms are used in the United States for the production of cigarette paper.

With the probability of home-grown flax being used for making cigarette paper, many thousands of acres of flax must be grown to meet these requirements. The flax required for papermaking is of short fiber length. Mr. Schweitzer explains in his article that there are two basic types of flax grown; one essentially for seed, and the other for fiber. The seed crop supplies the fiber desirable for the manufacture of paper.

All the long fiber from seed flax can be utilized in the textile industry for the manufacture of linen, leaving the short fiber available for the production of a purely domestic paper for cigarettes,

◆ A Recording Consistency Regulator

A new consistency regulator, in the design of which a recording instrument is incorporated to show the consistency of stock leaving the regulator, has just been announced. The new regulator is claimed to be adaptable to any point in



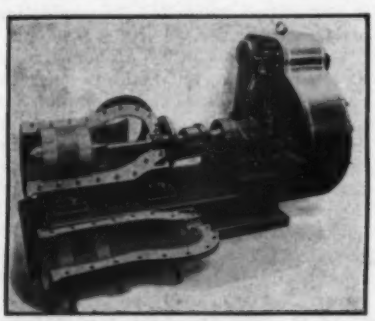
any stock slush system whether in a paper or pulp mill, and is installed by mounting it on the water-pipe line close to the valve which it is to operate.

This new unit, known as the recording consistency regulator, is being marketed by Arthur B. Green, Management Engineer, 249 Harris Ave., Needham, Mass.

◆ DeLaval Propeller Pump

A propeller pump, built for both horizontal and vertical installation and for all capacities and for heads up to about 40 ft., has been developed by the DeLaval Steam Turbine Co., Trenton, N. J.

The pump casing consists of two parts, which are separated in the plane of the center line of the shaft by a flat joint that is maintained air- and water-tight by a thin paper gasket. The pump case



cover can be lifted off to render the propeller and all interior parts accessible. The propeller, designed for the specific conditions of capacity, head and speed, is finished on all surfaces, the blades being carefully filed and scraped to templates to insure the shape required by hydraulic design. The casing around the propeller is protected by a separate sleeve, which can be renewed should wear occur. This sleeve supports the guide vanes by which the liquid is directed in smooth flow-lines. The shaft is protected from wear by a removable protecting sleeve which extends through the stuffing box and provides a bearing surface for the packing.

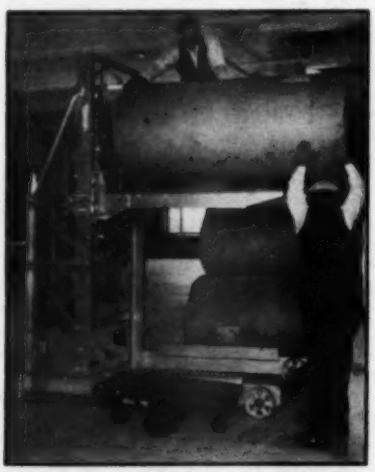
At the coupling end the shaft is supported by a grease lubricated ball bearing with a separate ball thrust bearing in the same housing. At the propeller end, the shaft is supported by a bearing of the sleeve type. The stuffing box is designed for soft packing, with a lantern ring to facilitate water sealing where desired. The gland is split and can be removed without disturbing the other parts.

The pump may be direct-connected to a standard speed electric motor or steam turbine, or a speed reducing gear may be used.

◆ Improved Type Paper Roll Lifter

To meet the demand for a lightweight, compact machine, the Economy Engineering Company, Chicago, has recently announced an improved type of paper roll lifter. This device, being available in both hand-operated and motor-driven designs, is equipped with ball bearings throughout.

Only twenty-five pounds pressure on the crank handle is said to be needed to elevate a newsprint roll on the plat-



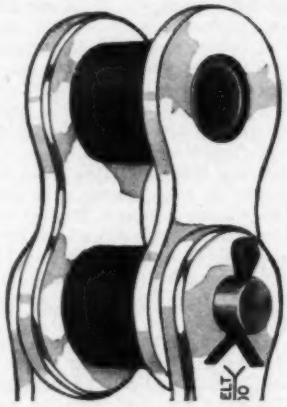
form of the hand-operated model, a cut spur gear reduction being used. The load on the platform in this type is lowered by means of a self-closing, gravity-type brake, which permits any desired speed of descent.

The electric machine is furnished with either a ½, 1, 2, or 3-h. p. motor, depending upon the speed of travel desired. The load, in the electric type, is controlled in both the up and down directions by the motor, which is a high torque reversing design.

Available in whatever height is desired to permit the piling of rolls two, three, or four high, such a machine is of either 1,500 or 2,000 lb. capacity. The heavier capacity is capable of handling rolls 72 in. long in the manner shown; the lifting surface measures 43 in. across by 60 in. out. Special devices prevent descent of platform should the cable at any time break or part, or the current fail while platform is in motion.

◆ Silverlink Roller Chain Announced by Link-Belt

The Link-Belt Company, Indianapolis, Ind., has announced a roller chain to be known by the trade-name Link-Belt Silverlink. The side bars of this chain



are especially treated to assist in resisting corrosion, and this treatment gives them the appearance of silver.

The construction features of Silverlink chain, made in all sizes from ⅜ inch to 2½ inch pitch and in single or multiple widths, include: Sidebars of heat-treated alloy rolled steel; nickel steel case-hardened pins-detachable type with cotter, or furnished riveted; solid steel case-hardened bushings; and alloy steel heat-treated rollers.

◆ James Announces Three-part Flexible Couplings

The D. O. James Manufacturing Co., Chicago, has recently announced a flexible coupling composed of only three parts and providing for complete flexibility.

The center member is made of non-metallic material self-lubricated by means of a reservoir within itself. This floating center member slides between the jaws of one metal flange on a line passing through the center. It is free to slide across face of second flange in a direction which is at right angles to the first, making it mechanically flexible without the use of flexible material. The two metal flanges are made of nickel iron of great tensile strength.

◆ Brookville Locomotive Series with Caterpillar Engines

The Brookville Locomotive Co., Brookville, Pa., is under production on a complete series of industrial locomotives with Caterpillar engines. This series involves the use of three Caterpillar

power plants, identical to engines used in its Model Twenty-Five, Model Thirty-Five and Model Fifty tractors.

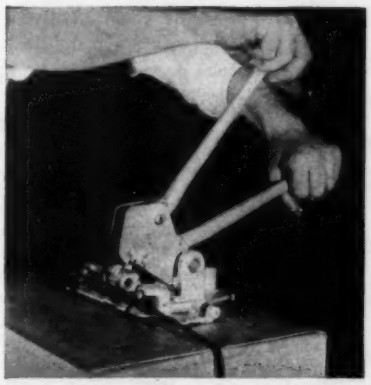
The BCL Series is supplied for all track gauges, and is now available in 5, 6, 7, 8, 10 and 12 tons weight. Four operating speeds are offered in both forward and reverse work, with range of approximately 2 to 15 miles per hour. They are supplied standard for the use of gasoline as fuel, with kerosene or alcohol burning equipment optional. Distribution will be primarily through Caterpillar dealers.

Brookville Bulletin No. 500, which fully illustrates and describes this series, will be supplied upon request.

◆ New Combination Strapping Tool

A single strapping tool which incorporates stretching, sealing, and cutting mechanism is now being marketed by the Acme Steel Company, Chicago. This new tool, it is claimed, reduces strapping operations to an exact science, and automatically assures a good strapping job. Strapping time is reduced, depending on the nature of the job, from 50 to 100 per cent beause many motions formerly required of two and three tool systems are eliminated.

In operating the Acme Combination Tool, the seal is snapped into the mouth



of the sealer and the band is inserted in the tool. Then one stroke of the stretcher lever tightens the band, and one stroke of the sealer lever applies the seal, seals it, and cuts the band from the coil.

When the above operations are completed, the tool still retains the loose end of the band so that it will be right at hand for the next package.

◆ Magnetic Friction Type Clutch

The Dings Magnetic Separator Company of Milwaukee, Wis., offers a new clutch to meet the demand for powerful magnetic friction type clutches of smaller physical dimensions. It is a simple magnetic friction clutch, having contact faces on both sides of a spring disc which are squeezed between the magnet and armature elements when the coil is energized. Provisions are made for adjustment to compensate for wear of contact faces. Light springs on the armature holding bolts serve to expel the armature when coil is deenergized, thus assuring ample clearance between the two clutch elements. The clutch is made with and without ball bearings between the hubs of the two clutch members as installation conditions might require to insure proper alignment.

The Dings Company has also developed a single spring disc clutch follow-

ing the same general construction as the above described unit, but having three friction contact faces.

It is the practice of the manufacturer to provide a housing over the slip ring brush holder assembly completely protecting it. The friction wearing faces are a hard and tough asbestos compound formed to fit the clutch disc to which they are securely riveted. Coils are form wound, vacuum pressure impregnated, and securely held in the magnet element from which they are amply insulated.

This clutch is without projections and all dowel pin holding bolts have locked nuts.

The common clutch installation is to mount the magnet element on the driving shaft and disc element on which only friction contact surfaces are mounted as the driven member. However, it is perfectly feasible to reverse the clutch mounting.

◆ Louis Allis Motorized Speed Reducers

Motorized Speed Reducers have been placed on the market by The Louis Allis Co., Milwaukee. The motor and speed reducer are combined into a single, compact, self-contained unit which makes an attractive, easily-mounted, slow-speed drive for many types of industrial machinery. Ratings available are ¾ to 75 H. P. with output speeds 4 to 400 R. P. M.

◆ New Midget Photoelectric Relay

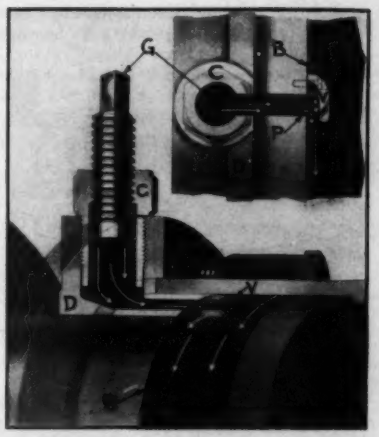
A new photoelectric relay has been announced by the General Electric Company, Schenectady, N. Y. This relay is applicable to installations where practically complete interception of the light beam is made, since changes of light intensity of at least 50 per cent are necessary for successful operation. The unit is particularly adaptable to counting applications inasmuch as the sensitive relay contacts will handle directly the usual types of magnetic counters. The unit will operate on light impulses of one-fifteenth of a second duration. The relay should also find many applications in the limit switch field.

Where the interrupting capacity of the sensitive relay contact is not sufficient to handle the device to be controlled, a small contactor or magnetic switch may be interposed between the sensitive relay and the controlled device.

◆ New Yarway Gun-Pakt Expansion Joint

Yarnall-Waring Co., Philadelphia, Pa., has applied the principle of pressure lubrication as a means of packing or replenishing the packing in its Yarway Cylinder Expansion Joint.

This new cast steel Yarway Gun-Pakt gland is similar to glands using commercial coil packing, except that the Gun-Pakt gland is stationary, being bolted securely against the end of shell of expansion joint. Means for the application of plastic packing have been provided by the use of two or more cylinder units (depending on diameter of gland). These fittings comprise a threaded stainless steel plunger (G) which operates inside a heavy cylinder (C), seated in the rim of the gland, as shown in the accompanying illustration. Yarway plastic packing material, developed espe-



cially for the requirements of the Gun-Pakt gland, is made of the highest grade long fibre asbestos, combined with an inert material in which high fire-test mineral oil is stored. This packing is prepared in pellets, shaped to fit the cylinder.

When the plunger (G) is screwed down, the packing (P) is forced into the stuffing box (B) through a channel in the body of the gland. Here an overhanging deflector vane (V) distributes the packing. Because of these deflector vanes, each piston and cylinder makes the packing move around the gland space in the same clockwise direction, thus insuring uniform density of packing in the gland. When necessary to re-

charge, each Gun-Pakt cylinder fitting can be removed from the gland while under regular line pressure, without disturbing the action of the gland. This is possible because the deflector vanes which act as check valves, prevent blowback. Recharging involves merely insertion of a new pellet of packing. Hence, gland may be repacked without removal of either the gland or the old packing. Alemite grease fittings are provided in the body of the joint in the packing space to provide lubrication for the moving sleeve, especially after long shutdowns.

The Yarway Gun-Pakt system and packing are good for pressures ranging from sub-atmospheric to the highest pressures and temperatures used in modern steam heating practice.

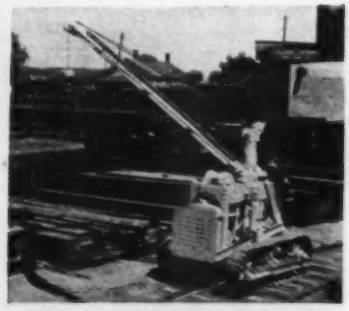
◆ A Rubber Belting Resistant to Chemicals and Oils

Rubber belting, which resists chemicals and oils, has been announced by The B. F. Goodrich Company, Akron, Ohio.

The new belting has given satisfactory service after complete immersion in oil for several days, while ordinary belting will last only one third as long when subjected to similar exposure, according to Goodrich engineers.

◆ Loadmaster Now Available with Caterpillar Power

Bucyrus-Erie Company, South Milwaukee, Wis., announces the new Model CT Loadmaster powered by a Caterpillar engine and mounted on Caterpillar tracks. This unit, a compact



crane of 4,500 lb. lifting capacity, has a full revolving boom. Besides lifting, swinging and carrying loads, it can also be used for hauling trailers.

The company will gladly answer all inquiries for further information on the Loadmaster.

◆ Shafer Announces New Line of Boiler Bearings

A new line of single row, self-aligning, radial roller bearings is being offered by the Shafer Bearing Corporation, 621 South Kolmar Ave., Chicago.

A single row Shafer concave bearing (of full roller type) is used, with rollers operating between a straight outer race and a convex inner race. This design is said to assure liberal radial load capacity, with ample provision for the limited thrust capacity needed in applications having moderate loads.

According to announcement from the company, a complete new catalogue, designated as catalogue No. 12, of the entire Shafer line of self-aligning units, will soon be available for general distribution.

◆ Amthor Tensile Strength Tester

A new instrument for testing tensile breaking strength of paper products has just been designed by the Amthor Testing Instrument Co. Inc., Brooklyn, N. Y., and is their type No. 270. Accuracy, extreme simplicity of operation, and rapidity of test are features stressed. The dial is 8½ inches in diameter, reads directly in fractions of either pounds or kilograms, and is hand calibrated for

accuracy. The dynamometer spring movement is specially designed for tensile testing so that sensitivity of test and elimination of friction are assured by the free-floating construction of both movement and upper clamp. When the specimen breaks, the pointerremains at the exact tensile strength reading. Jaws and jaw travel for testing any such material as paper or cordage can be had in full accordance with recognized standard specifications for such tests.

◆ Cornell Rolling Grille

A new product, known as the Cornell rolling grille, has been announced by Cornell Iron Works, Inc., Long Island City, N. Y. for use in place of gates, partitions, cages and doors. The grille commonly consists of rolled and press steel bars joined together with strong ornamental links with straight links in side guides. The grille travels up and down in two vertical cold roll steel channel-shaped guides about 1¼ in.x 1¼in. Bronze, rustless steel, or aluminum rods and links may also be used in the construction of a grille.

When a grille is coiled up on a horizontal shaft it is between 10 inches and

16 inches in diameter. The usual installation is made on the face of a wall where it can be made to coil under the lintel and, if furred in, become entirely hidden when open.

Complete specifications and prices will be forwarded upon request.

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◆ Goulds Acquire Hydroil Corporation

Norman J. Gould, president of Gould's Pumps, Inc., has announced the acquisition of the Hydroil Corp., Lebanon, Ind., manufacturer of oil purifying apparatus.

The Lebanon plant is being discontinued and the business and equipment transferred to the Seneca Falls plant of the Gould company. D. B. Clark, vice president of Hydroil, and W. P. Alexander, factory and field representative, will join the Gould organization, which will continue to manufacture the Hydroil centrifugal purifying machines at Seneca Falls, with production planned to begin with the first of the year.

Goulds Pumps, Inc., is one of the oldest and best known pump manufacturing firms in the industry, and its experience in the manufacture of centrifugal pumps makes it possible to swing immediately into production of the entire Hydroil line.

◆ THE REEVES PULLEY CO., Columbus, Ind., has established a direct factory branch office in Chicago, located at 39 S. Clinton Street. This office is in charge of D. C. Batterson, who has had a wide experience in connection with variable speed control and its many applications.

◆ President Willson Reviews the Past Year

Commenting upon the pulp and paper industry in 1932 and its prospects for 1933, S. L. Willson, president of the American Paper and Pulp Association, summarized conditions as follows:

The decline in the domestic production of pulp and paper which began in 1931, continued until July, 1932, when a low level was apparently reached. In the latter half of the year, the production trends remained practically level, although some grades gave indications of rising. Withal, however, the industry is operating at about 50 per cent of capacity.

In the first half of 1932, price levels changed but little. In the latter half, however, substantial reductions occurred in practically all grades, bringing prices as a whole to levels that are materially below those of 1913. Although the downward movement was apparently checked at the end of the year, immediate reversal does not seem likely until the volume of sales increases.

In the competitive selling of paper, which has been the most intense that the industry has ever experienced, there has been a marked breakdown in trade practices and customs in many grades that has added to the chaotic condition of the market. The destructive character of the abrogation of trade customs is being recognized, and some groups of manufacturers are undertaking co-operative efforts to re-establish the uniform fundamentals of marketing.

The wood pulp industry has undergone a more marked deflation than has paper manufacture, because of the unsettled conditions in international trade. Importations of chemical pulps have been maintained at near former levels, but the domestic consumption has fallen off in harmony with the decline in paper use. The result has been manifested in a sharp reduction in the sales of domestically produced pulp. Furthermore, many mills which normally manufacture their own pulp requirements have switched to foreign pulp.

Moreover, the industry views with apprehension the sale of foreign-made paper at below-market prices. Heretofore, the volume of these sales has not been important, but the low prices that are being quoted have exerted a strong influence upon domestic prices. This condition is due chiefly to depreciated currency competition.

The industry as a whole is going through a period of drastic cost reduction, probably the most severe test that it has ever experienced. Costs of materials other than wood pulp have been reduced and the costs of pulpwood have decreased in some instances to lower levels than have existed since the beginning of the century. There has been a general reduction in wage rates throughout the industry, but these reductions have been in most cases not more than 15 per cent.

The industry does not look for an immediate upturn of important proportions. Operations are being planned on the basis of a gradual increase in business over a relatively long period, in which increase in volume of sales must precede higher prices. In the meantime, every effort must be made to protect the industry's resources and its market outlets. This is beyond the means of the individual manufacturer; it is an industry job in which all must participate.

◆ Annual Meeting A. P. P. A.

As previously announced, the annual meeting of the American Paper and Pulp Association and affiliated organizations, will be held at the Hotel Pennsylvania, New York City, February 13th to 16th, 1933.

The annual business meeting of the American Paper and Pulp Association will take place on Thursday, February 16th, 1933, beginning at 10:30 A. M. At this meeting some of the most important problems before the industry will be discussed. The annual business meeting will be followed by a luncheon which this year will take the place of the Thursday night banquet. An outstanding business man will make the principal address at the luncheon.

Arrangements have been made with the railroads for special rates to and from New York City for convention week. The certificate plan is being used this year as during the past two years.

The annual meeting of the National Paper Trade Association will be held the same week, beginning on February 13th, 1933.

◆ Annual Superintendents Meeting in Green Bay

The fourteenth annual convention of the American Pulp and Paper Mill Superintendents Association will be held June 8, 9 and 10 at Green Bay, Wis.

Frank J. Timmerman, mill manager of the Northern Paper Mills, is general chairman of the convention committee in charge of arrangements.

◆ Officers Elected by The Paper Foundation

The Board of Governors of the Paper Foundation met in Chicago January 6. At this meeting it was decided to form an Illinois corporation, not for profit. Under this plan, the Board of Governors are made directors of the newly formed corporation. The following officers have been elected: President, Phil A. Howard, publisher of *The American Paper Merchant;* vice president, W. N. Gillett, president The Chicago Paper Co.; secretary-treasurer, H. R. Knott, president Salesmen's Association of the Paper Industry.

Further plans were formulated at this meeting for a systematic and intensive drive to assure the success of the paper exhibit at A Century of Progress.

◆ A NEW CORPORATION, known as the Carthage Papermakers, Inc., has been organized for the purpose of operating the plant of the Carthage Pulp & Board Co. It is believed the mill can be operated at a profit besides being a relief measure for unemployed. Eight hundred shares of stock, $25 a share, have been offered for sale.

◆ Production and Selling Divisions Created by Gair

To meet the demand of present-day conditions for greater specialization in production and sales, the Robert Gair Company, Inc. has created three major divisions to handle its production and selling of boxboards, containers and folding cartons.

The Boxboard Division will be headed by Robert H. Bursch, who will have charge of both manufacturing and sales. L. H. Gaetz will continue in charge of production of the Folding Carton Division. F. S. Wakeman, has been appointed general sales manager for the Folding Carton Division. He will continue in charge of the New York Sales Department. F. G. Becker has been appointed general manager of the Container Group of Gair Plants. Mr. Donaldson also announced the appointment of Chase Flint as general sales manager of the Container Division. Both Mr. Becker and Mr. Flint were formerly associated with the Container Corporation of America in executive capacities.

◆ Seabury Smith Gould

Seabury Smith Gould, vice president of Goulds Pumps, Inc., passed away at his home in Seneca Falls November 25, at the age of 44 years.

Mr. Gould was born in Seneca Falls. After completing his education at Cornell University and Hamilton College, he entered the sales department of the Goulds Manufacturing Co. From that time he advanced to the position he held at the time of his death with the organization now called Goulds Pumps, Incorporated.

Surviving Mr. Gould are the widow and one son, Seabury Smith Gould.

◆ John A. Harlow

John A. Harlow, superintendent of the sulphite mill of the Penobscot Chemical Fibre Co., Great Works, Maine, passed away suddenly at his home in Old Town, Maine, December 13, at the age of 52 years.

As a young man, after finishing college, Mr. Harlow entered the employ of the Penobscot Company as assistant chemist. When the new sulphite mill was built, he was made superintendent.

Mr. Harlow is survived by his widow, two sons and a daughter.

◆ Dard Hunter Publishes Sixth Book

That master craftsman, Dard Hunter, has added another work to his list of rare books. This author's sixth book, *Old Papermaking in China and Japan*, has just been released from his private press.

The edition consists of only 200 copies. It is permanently bound, the work having been done by Peter Franck, Gaylordsville, Conn., who is said to be unexcelled for his technical excellence

in bookbinding. The wood-engravings used were cut by Julius J. Lankes. The books have been printed in the hand-cut and hand-cast type which is used for the last time. The paper was made especially for this edition and each sheet bears the bull's head and branch watermark.

The object of this book is to enlighten by the use of illustrations and by actual specimens of papers rather than by extended comment. The text is limited to a biography of T s'ai Lun, the inventor of papermaking, and to an analysis of certain Chinese characters of bibliographical significance. The illustrations are provided with comprehensive captions which serve to show the actual processes of papermaking in the Orient in years gone by. The original specimens of Chinese, Japanese, Persian, and Tibetan papers have been gathered together during the past ten years and constitute a veritable museum of old papermaking. The illustrations consist of five full-page photogravures, eleven prints in color, and twenty-one reproductions in black.

The book is priced at $75.

◆ NORMA-HOFFMAN Bearings Corp., Stamford, Conn., announces that John W. MacMorris has been engaged as factory manager. Mr. MacMorris has had many years of production experience including nine years with S. K. F. Industries.

◆ WHITING - PLOVER Paper Co., Stevens Point, Wis., has transferred its eastern office to the National City Bank Building, 17 East 42nd Street, New York City. This office has been placed directly under mill control instead of being operated by a sales agency as before, and is in charge of Louis Gailer.

◆ GEORGE P. BALDWIN, vice president of the General Electric Company in charge of activities connected with steam railroad electrification and such other duties as assigned by President Gerard Swope, passed away suddenly December 7 in the Doctors' Hospital, New York City, after an illness of only a few days.

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◆ New Catalogues and Publications

Asten-Hill Mfg. Co., Scott's Lane (East Falls), Philadelphia—This company has just issued a leaflet on its new Clipper Seam, which is supplied on request with Asten Asbestos Dryer Felts. This seam has been developed to assist paper mills with a troublesome problem—the dryer felt seam. An article by H. N. Hill of this company on the subject of Dryer Felt Seams has been published in leaflet form.

Armstrong Machine Works, Three Rivers, Mich.—A new manual on steam trap engineering and containing complete information on the Armstrong line of traps is available upon request. The book is designed to be of special benefit and interest wherever steam is used and is said to be the most complete treatise on this phase of steam engineering that has been published.

R. Fuess, Inc., 245 West 55th St., New York—A bulletin entitled "Paper Testing Apparata" describes the Bekk combined smoothness and porosity testing apparatus, the Riesenfeld-Hamburger dusting or fuzz tester, and the Riesenfeld-Hamburger stiffness tester. In each case, the purpose of the instrument, as well as the method of operation, is carefully explained. The Bekk apparatus is designed to give numerical readings of smoothness differences existing in papers, as well as for measuring the permeability of paper to air. The use of the dusting or fuzz tester makes possible the establishment of numerical factors for comparing dusting properties in papers, while the stiffness tester makes possible comparisons of paper stiffness.

General Electric Co., Schenectady, N. Y.—The latest publication received from this company is a very complete and extensive catalogue on Synchronous Motors. The introduction carries a brief history of the pioneer work done in this field by the G. E. Company. Chapters are devoted to the various types of synchronous motors. The text is interspersed with many illustrations, curves and tables. Another section of the book is devoted to the applications of synchronous motors in various industries, including pulp and paper.

Harnischfeger Corp., Milwaukee, Wis.—"Weld It Well" is a new, illustrated catalogue on the latest developments in welding practice and welder design. Several pages are devoted to direct illustrated comparison of old-time practice and modern welding methods. A cross-section colored illustration forms a double spread in the middle of the booklet. This shows the insides of the P&H Hansen Electric Arc Welder and points out the efficiency points of the modern arc welder. In addition, much interesting data is given which contributes to arc welding advancement.

Hercules Powder Co., Wilmington, Del.—In the October issue of *The Hercules Mixer* a very interesting article appeared under the title "Paper Makers Chemicals Modernize an Ancient Industry." This article takes up papermaking from its beginning with a brief history of its manufacture in this country. The process is reviewed with respect to all of the chemicals used. The article is illustrated with views of the plant of the Paper Makers Chemical Corp., Kalamazoo, which is a unit of the Hercules company.

Ingersoll-Rand Co., 11 Broadway, New York—A new bulletin on surface condensers issued by this company illustrates many of its condenser installations ranging from small units up to those of 160,000 kw. capacity. Features discussed include: single- and two-pass construction, heart-shaped shell, external air coolers, longitudinal steam distribution, and tube-sheet arrangement. Separate sections are devoted to small condensers, steel-plate condensers, and marine condensers. Copies on request.

Moeller Instrument Co., 261 Sumpter St., Brooklyn, N. Y.—This company announces a new catalogue on mercury and dial indicating thermometers, barometers, vacuum gauges, etc., in which is listed what is said to be the most complete line of instruments of this type described by any manufacturer under one cover. A patented feature of the company's mercury indicating thermometer is the Moeller Glass Red Reading Column which has the practical effect of making mercury thermometers easy to read under all light conditions. Copies on request.

Morse Chain Co., Ithaca, N. Y.—A new catalogue, No. 51, sets forth all the details in the manufacture of Morse Roller Chains. There are a unmber of illustrations, drawings, data and prices.

Philadelphia Gear Works, Philadelphia, Pa.—Bulletin No. MR 33 features this company's new MotoReduceR, which is a combination of motor and speed reducer in one housing, furnished in horizontal and vertical types. Dimension tables, horsepower ratings and speed reductions of the different types are given, and there are a number of illustrations.

Stephens-Adamson Mfg. Co., Aurora, Ill.—This company has acquired the United States right to manufacture and distribute the English Redler Conveyor, which is claimed to convey horizontally, vertically, up inclines and even around corners. A catalogue has just been issued to explain the novel principle upon which this new conveyor operates.

Sullivan Machinery Co., Chicago—A new 32-page catalogue features advantages and new developments in Angle Compound air compressor design and stresses the ready adaptation of this particular compressor type to direct motor drive. Attention is also devoted to partial capacity operation, to the adaptability of the "twin" units and to the power economies involved in the manufacturer's multi-step control. Automatic controls of several types are also described. Copies on request.

BOOKS

The Chemical Utilization of Wood, a handbook presenting a comprehensive picture of the wood by-products industries, has been released by the National Committee on Wood Utilization of the United States Department of Commerce. The report is the work of Dr. Henry K. Benson, Chairman of the Division of Chemistry and Chemical Technology, National Research Council, Washington, D. C.

Beginning with a brief description of wood as a raw material and its physical properties and chemical composition, the report deals primarily with the different chemical processes and the products resulting. Wood pulp, naval stores, wood distillation products and the utilization of by-products are given exhaustive treatment in the report's 150 pages. With each chapter a valuable list of references to existing technical literature is included.

The wood chemical report may be purchased for 15 cents a copy from the Government Printing Office, Washington, D. C., or from the branch offices of the Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce.

The Development of American Industries, a new book planned and edited by John George Glover and William Bouck Cornell, both of the faculty of the School of Commerce, New York University, depicts the stories of thirty-nine major industries, one of which is the pulp and paper industry. The book is the result of the cooperative efforts given the editors by specialists contributing material for each of the respective fields, one chapter being devoted to each industry with the single exception of textiles. In covering the textile industry it was deemed appropriate to include a discussion of the industrial revolution as well as to cover the industry itself. Therefore, two chapters rather than one have been used to tell it.

In general, the treatment of each industry is somewhat similar, covering the industry's early history, discoveries and operations, growth of the industry, geographic location, raw materials, manufacturing processes, important products and by-products, methods of marketing, methods of financing, possible future developments, etc.

The chapter covering the pulp and paper industry covers approximately thirty-five pages of text that is illustrated with tables, graphs and charts, and a flow diagram that shows materials and equipment used in the manufacture of typical wood pulps and papers. This chapter, a contribution by the American Paper and Pulp Association, Charles W. Boyce, Executive Secretary, with critical review and comment by W. G. MacNaughton of the International Paper Company, not only makes interesting reading but contains information of importance to any one associated with the industry or interested in its activities.

This book to the business man should be valuable as a reference, since it permits easy comparisons of one industry with that of another. It contains over nine hundred pages and sells for $6.00. The publishers are Prentice-Hall, Inc., 70 Fifth Avenue, New York.

◆ Ross Remodels Power Plant

The J. O. Ross Engineering Corporation has recently completed the rebuilding of the Stratton furnace settings installed several years ago at the Bridgeport, Pa. plant of the Continental-Diamond Fibre Company.

Originally, two Stratton furnaces were installed under two Heine 435 hp. boilers in battery setting and designed to operate at 200 per cent rating. Recently, however, it was decided to remove the center wall to a point just above the first tube row and convert the two units into one with an output of 45,000 to 50,000 lbs. of steam per hour.

This has been done and the unit is now running steadily at that output with an average actual evaporation of 11.2 lbs. of steam per pound of coal.

One-half inch bituminous slack is run through a hammer mill with ¼-in. screen, then fed direct to the furnace and burned in suspension. There is no noticeable discharge of fly ash from the stack.

Much interest in this installation has been noted in the Philadelphia district.

John F. O. Stratton, the inventor of the furnace was in charge of this work for the J. O. Ross Engineering Corporation. The whole improvement was under the direction of C. S. Rankin, power engineer.

◆ R. S. Hatch Goes with Weyerhaeuser

As a result of a recent decision by the directors of Weyerhaeuser Timber Company to establish a research department, R. B. Wolf, manager of the company's Pulp Division at Longview, Wash., has been commissioned to build the foundation of such a department at Longview. The aim of this department will be to study problems dealing with the conversion of wood into marketable products, the development of special fiber qualities to meet the specific needs of the paper and other pulp consuming industries, and the conversion of mill waste into useful products.

R. S. Hatch, well-known technical man in the pulp and paper industry, has been chosen by Mr. Wolf to head the new department, and will immediately take up his new duties at Longview. Mr. Hatch has been in charge of technical development of the Pulp Bleaching Corporation for the past five years and brings to his new position a wide experience in the technical and operating fields of the industry, as well as valuable experience in the manufacture of fine organic chemical products and dyestuffs.

◆ Dill & Collins Company Acquired by Mead Corporation

An announcement of interest to the industry was the recent acquisition by the Mead Corporation, Chillicothe, Ohio, of the plant of the Dill & Collins Co., Philadelphia.

The Dill & Collins Co. has been operating under receivership for the past year. It is estimated this company's holdings are valued at approximately $1,000,000.

The executives of the Dill & Collins Co. will be retained; Grellett Collins will continue as president.

The Mead Corporation will discontinue its executive offices heretofore maintained in Dayton. All offices and personnel of the company will be consolidated in one office at Chillicothe.

◆ THE HAWLEY Pulp & Paper Co., Oregon City, Ore., has been taken over by the Western Cooperage Co. Watson Eastman, president of the Western Cooperage Co., has been elected president of the Board and will take over the management of the company. Mr. Eastman served as chairman of the Hawley bondholders committee for several years and is qualified to take over the affairs of the company.

◆ AN INSULATING board has recently been introduced on the Netherland India market, which is manufactured locally out of sugar cane bagasse and cement, and which is claimed to be fireproof, waterproof, heat resistant, and able to be sawed and nailed. This board is made up in sheets of 4, 2½ and 1 centimeters (centimeter is equivalent to 0.3937 inches). Boards made up in a thickness of 4 centimeters measure 40 centimeters in width and any length up to 2 meters (meter is equivalent to 39.37 inches). Boards having a thickness of 2½ centimeters measure the same in width but have a length only up to 1½ meters. In both instances the sheets have been grooved on the short side so that when placed lengthwise they fit into each other and form walls for cheaper houses, warehouses, etc. The thinnest sheets, of 1 centimeter, are made up in all lengths and widths up to a maximum of 1 meter. Among other uses they are recommended for ceilings. (Assistant Trade Commissioner Carl H. Boehringer, Batavia.)

◆ Report of Research on Lithographic Papers

The Lithographic Technical Foundation reports that its research on lithographic papers, carried on as a joint project with the U. S. Bureau of Standards, has been continued during the past year and has made good progress.

After a discussion of the results of the past year's work at the recent annual meeting of the Advisory Committee, the meeting adjourned and the committee members were conducted on an interesting tour of inspection of the laboratories of the Paper Section.

To complete the study of causes of misregister, it was necessary for the Bureau to install considerable new equipment to permit better operation of the small humidity room, the temperature and humidity of which can be varied over a wide range. This room was completed last July, and studies have been made on twelve lithographic papers which include the commercial and experimental papers previously subjected to practical printing tests. These studies were as follows:

1—Determination of the time required to condition papers with different moisture contents to equilibrium with an atmosphere of 45 per cent relative humidity.

2—Determination of the moisture contents of the various papers at various relative humidities from 28 to 72.5 per cent.

3—Determination of the variation of the equilibrium moisture content of the papers at various relative humidities, depending on the direction of approach.

4—Bursting strength, tensile strength, tearing strength, and folding endurance of the papers at various relative humidities.

5—Changes in dimensions of large sheets of the papers with known variations in relative humidity and comparison of these results with the abilities of the various papers to maintain register as found in the practical printing tests.

During the year, a report of the results of the practical printing tests, carried out in the plant of the American Lithographic Company in 1931, was completed and published in the Bureau of Standards Journal of Research for September, 1932. Reprints of this report are now available from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents per copy. The title is "Research Paper No. 480, Register Study in Offset Lithography." It is an interesting fact that the results of the laboratory tests corroborate the evidence, obtained in the practical printing tests, that the degree of beating and jordanning of the stock determines its sensitivity to variations in atmospheric humidity. It is also important that all of the evidence obtained points to the neighborhood of 45 per cent relative humidity as the best atmospheric condition for the production of printing in register.

The future research program includes the completion of some of the laboratory work already begun, a detailed study of the hysteresis effect on the dimensions of papers, investigation of the effects of temperature changes on paper properties at a constant relative humidity, and determination of the effects of stresses on large sheets of paper at various relative humidities. In the discussion of this program, emphasis was placed on the importance of slight variations in flatness due to stresses set up in the sheet during the impression. Emphasis was also placed on the necessity for a study of theory and practice of paper conditioning.

The resources of the Bureau of Standards have suffered somewhat from the necessity for retrenchment during the past year. The importance of research on lithographic papers, however, is so great that one third of the resources of the Paper Section have been allocated to it. It is expected that a second series of practical tests will be made during the coming year in the Lithographic Department of the U. S. Coast and Geodetic Survey in Washington.

POWER

GENERATION + UTILIZATION + MAINTENANCE

This section turns the searchlight on power and its allied problems, showing big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worth while practices suggest new ideas and wider usages of equipment.

By W. S. JOULE

◆ Differential Compounding May Reverse Starting Torque

Occasionally a direct current motor will reverse itself when the load is picked up too rapidly. This mysterious action is rather baffling to a repair man because the connections may apparently be correct. To solve such a problem, it is necessary to understand the effect of a compound field.

Two arrangements of the compound motor are in use, according to whether the current in the series winding opposes the magnetizing action of the shunt winding or helps it. The first arrangement is called the differential-compound winding, and the second arrangement the cumulative-compound winding.

When a differential-compound motor is loaded, the current through the armature and series field winding increases and by opposing the magnetizing current in the shunt field winding, reduces the armature flux, thus decreasing the counter-electromotive force, if the speed remains constant. If this decrease of flux is just sufficient to give the requisite decrease of counter-electromotive force so as to permit current to flow through the armature sufficient to enable the motor to carry its load, then the motor speed will not fall off with the increase in load; at least not until the load becomes excessive.

Differential compounding of a motor is used to prevent the decrease of seed with increase of load, or even to cause an actual increase of speed with increase of load, up to full load. The shunt motor, however, runs at a speed which is nearly enough constant for most purposes, hence the differential compound motor is seldom used.

Speed of the cumulative-compound motor decreases considerably with increase of load. Such a motor has, however, the great advantage that at starting, when the current through the armature and series field winding is large, the total field excitation is large, hence the torque is large. That is to say, the cumulative compound motor has a large starting torque, like the series motor.

One disadvantage of the cumulative compound motor is that its running speed decreases considerably with increase of load, on account of increase of flux, produced by the series field winding. This disadvantage may, however, be obviated by providing a device for automatically cutting out the series winding by short circuiting it, after the motor is fairly started. The machine then runs as a simple shunt motor.

Most motors are connected for cumulative compounding, that is, the series field helps the shunt field instead of opposing it. It is well to keep this point in mind, since occasionally a motor is accidentally connected differentially compounded and, for certain types of service requiring extremely high starting torque, such as for hoisting duty, the differential effect is sufficient to actually reverse the rotation of the machine during starting. This is due to the opposing effect of the series field overcoming and reversing the effect of the shunt field.

◆ Application of Unit Heaters

The unit heater is particularly effective in heating large spaces of considerable height where it is difficult to maintain a comfortable temperature in the working zone, without greatly overheating the upper portion of the building. It is made in a number of types over a complete range of sizes to operate individually or in multiple. In its simplest form, the unit heater resembles an automobile radiator backed by a motor-driven propeller type fan. Generally, the unit is suspended from the supply main or supported on column or wall brackets. Multiple units are more intricate in design and may be driven by motor or turbine. Extended surface coils are provided and the fans are of the multi-bladed type mounted on a common shaft. The units may be floor mounted, supported on wall brackets, or suspended, as the case requires.

There is also variation in the control. Both steam and air flow may be regulated, but for the smaller steam units the thermostatic regulation is generally arranged to stop and start the fan motor. One or a number of heaters may be regulated effectively from a single control. Stopping of the fan stops air circulation, and with no air passing over the surface, the heat output of the unit drops to a small fraction of the operating value. This method imposes an irregular load on the boiler and when operation is resumed there is a tendency to flood the drain trap. Better results are to be anticipated from thermostatically controlled mixing dampers which so modulate the temperature of the air from the heating surface that it is delivered into the working zone at a temperature just sufficient to balance the heat losses from the building. Constant volume and velocity of air delivery are maintained, so that the circulation in the room is not interrupted.

When the heating medium is hot water, it is possible to vary its temperature or circulation in accordance with the heating requirements while maintaining a constant fan speed.

◆ Automatic Feed-Water Regulation

With the present practice of running boilers at high ratings, high furnace temperatures, and small water storage space, there is a call for a sensitive water level adjustment. Every change in load should be met with a change in the feed water rate. It is impossible to obtain this sensitive adjustment by means of hand regulation and for this reason automatic regulators have been developed to meet the needs of the situation.

Modern practice in the matter of feed water regulation, demands that the furnace must be given time to adjust itself to the reduced or increased load conditions before a great change in the water level or the amount of water fed to the boiler is made. For example: with a sudden increase in load, there is a drop in boiler pressure which releases heat stored in the water. This heat in the form of steam bubbles causes the water level to rise; hence a regulator properly designed decreases the valve opening, temporarily cutting down the boiler feed rate in cases of a peak load. If the load drops off suddenly, there is a rise in pressure and boiling ceases, with a resulting fall in water level. With this fall in level, the feed valve opens and increases the rate of feed water flow to the boiler, thus absorbing the heat which is being generated by the furnace until the furnace condition can be adjusted to load condition.

◆ Condensate Pump Operates On Low Suction

A condensate pump must deliver water against the head corresponding to the vacuum in the condenser, plus the friction head and the static head. As the absolute pressure in the condenser is small, hot-well pumps should be installed so that there is sufficient head on the suction to produce the required entrance velocity.

Condensate pumps are frequently installed with a head as low as 18 in. on the suction, although a higher head should be provided when possible. For this class of service, reliability of operation, simplicity and pump efficiency are of great importance.

+ CANADIAN NEWS +

◆ Sweezey Advises Central Newsprint Sales Agency

R. O. Sweezey, of Montreal, who for years has occupied a prominent place in regard to the pulp and paper industry in Canada, is now advocating the establishment of a central agency to control the marketing of newsprint. He set forth his plan in a radio address recently delivered at Montreal, in the course of which he combated the belief that over-expansion of the industry had been of the most reckless character. With business enough to operate the whole industry at half capacity in times like these, he said, it is not unlikely that under normal conditions all of the capacity of the present plans in Canada could be kept in operation. The outlook, therefore, from a business standpoint, is not so bad; in fact it is good.

He criticized the mergers which have taken place, saying the theory that it would cost less to operate various mills under one management had been shown in practice to be utterly wrong, and furthermore, the financial structures of some of the mergers were open to serious criticism.

One or two men of ability could easily organize such an undertaking, he said. The results would be that every mill would receive the same price for its product, and the management could direct its attention to lowering of costs and elimination of waste instead of spending its valuable time in the luxury of a large city.

◆ HON. W. J. WALSH, Minister of Mining and Agriculture for Newfoundland, recently went to New York and Portland, Me., with his solicitor, to confer with United States interests in connection with pulpwood deals. On his return Mr. Walsh said he could say nothing concerning the conferences, except that certain proposals had been made which would be submitted to the Newfoundland Government.

◆ Newsprint Negotiations Progressing

At the annual meeting of the Bank of Montreal, held last month, Sir Charles Gordon, the president, said that the leaders of the newsprint industry were well advanced in the intricate valuations and other compilations necessary as a basis upon which to formulate plans for a practical solution of the critical situation at present facing the industry.

The principal matter of discussion in the recent conferences has been the necessity of evolving some scheme to keep the producers together and prevent an open break in marketing arrangements as they already exist. Prevention of such a step involves a re-allocation of tonnage. It was anticipated that an agreement would be reached on this matter to take care of some of the more hard-pressed companies. An unconfirmed report is that the re-allocation of tonnage agreement as put forward and which, as far as can be learned, has not been approved, provided that International Paper would contribute to the general fund something like 60,000 tons. Anglo-Canadian's quota is said to have been 15,000. Mersey Paper is also mentioned as one of the companies that was giving up tonnage to be distributed among the less fortunate operators. It is stated that a temporary arrangement has been entered into by the operators which will hold things together until the conference is able to come to an agreement on some more permanent form of cooperation.

While the Federal Government has abandoned for the time being any intention of intervening in the newsprint situation, interest attaches to the proposal made some time ago from Ottawa to the newsprint industry. The proposal was rejected, but if conditions warrant, may be revived at some future date. The degree of authority with which the proposition from Ottawa was presented to the companies cannot be learned, but, in any event, overtures which were generally accepted in the industry as bearing the stamp of the Federal Cabinet were advanced, though never acted upon. The proposal, it is learned, was for the Federal Government to obtain the necessary power from Parliament to control exports of newsprint by federal license. Having done this, the Government would have proceeded to ration production among Canadian newsprint mills, cutting down the output of some and increasing the output of others. It is understood that many of the companies were favorable to such a policy, while others were vigorously opposed.

◆ INTERNATIONAL Power and Paper Co. of Newfoundland has under consideration a change in the plans respecting the cut of pulpwood this season. Originally the company had intended cutting about 40,000 cords of pulpwood, but consideration is now being given to a cut of 85,000 cords, with the possibility of a further increase to 100,000 cords.

◆ PRODUCTION OF NEWSPRINT by Canadian mills during November amounted to 161,334 tons, an increase of 3,828 tons over October and a decrease of 14,309 from the output of November, 1931. For the eleven-month period of 1932 ended with November, output of the mills in Canada amounted to 1,770,424 tons, as against 2,054,408 in the corresponding eleven-month period of 1931, a decrease of 14 per cent, and with 2,495,628 tons in the first eleven months of 1929, the year in which production reached its peak in the Dominion. The exports of newsprint in November totalled 3,071,376 cwt. valued at $6,631,241, which was larger in volume than the October export of 2,978,691 cwt. but lower in value, the latter being $6,754,504.

QUEBEC

◆ Premier Taschereau Warns Newsprint Producers

While conferences are still proceeding between newsprint executives in an attempt to arrive at a cooperative basis in the matter of newsprint production and prices, Hon. L. A. Taschereau, premier of Quebec, has interjected himself into the situation with a stern warning to the companies concerned that, if they do not come to an agreement, the governments of Quebec and Ontario would take action. Premier Taschereau made this announcement in a public speech in Montreal, last month, introducing the subject by saying: "The pulp and paper problem is one common to Ontario and Quebec, and unless the pulp and paper people straighten out their affairs they will find action taken by the two governments to settle the matter, for it is not proposed to permit the forests to be depleted to make paper to be sold below cost."

The premier quoted the figures of the pulp and paper industry in 1920 and in 1930. In 1920 there were 100 mills in Canada; in 1930, 109 mills. The value of production in the decade had risen from 100 millions to 215 millions. The number of employees had increased from 31,000 to 33,000, an increase of only 2,000. The wage bill in 1920 was $45,000,000 and 10 years later it was still at the same figure. The capital employed was 22 millions in 1920 and 714 millions in 1931, or 35 times as great. It was not the Government that had increased the capital, said the premier. The fault was with the mill operators themselves, and he must repeat what he had said recently, that there were too many financiers in the business and not enough paper makers. When you see in ten years the production doubled, the wage bill the same, and the capital multiplied 35 times, you know where the blame lies. Where is the remedy and what is the cure? It is in the hands of the industry itself.

"Let these people not look to the Government for the remedy and cure. If the gentlemen of the industry do not take heed, the governments of Ontario and Quebec may have to look into something. I will tell you we are not going to allow our forests to be depleted for paper to be manufactured below cost. I am not ready to speak for Ontario, but the problem is the same there, and the remedy is the same there. We have often had perfect understanding with Ontario, and I believe on this score we can have perfect understanding and see that our forests are not depleted for the benefit of those who have created a capitalization of 718 millions in their industry when perhaps it is not worth 25 millions."

The above statement has created a great impression, especially in financial circles. The statement of the premier that the industry here has been capital-

ized at $718,000,000 when perhaps it is not worth $25,000,000 is taken to indicate that further wholesale reorganization of capital structures is likely to be one of the outcomes of the present negotiations.

◆ Lake St. John Bondholders Meet

Bondholders of Lake St. John Power and Paper Co. met in Toronto last month, when the resolution appointing a committee to cooperate with the National Trust Co., the trustee, to investigate the company's affairs and to make suggestions looking toward reorganization, was passed by a large majority, only $2,500 of the $2,945,500 vote being opposed.

The committee consists of G. A. Dobbie, Galt; H. Horsfall, Toronto; H. R. Jackman, Toronto; W. S. Lighthall, Montreal; D. H. Macdougall, Toronto; John Stadler, Montreal, and A. F. White, Toronto. The bondholders' committee and the debenture holders' committee have organized, D. H. Macdougall, chairman of the board of Rogers-Majestic Corp., having been appointed chairman of the bondholders' committee, and A. Stewart McNichols, president of the Quebec Pulp and Paper Corp., having been appointed chairman of the debenture holders' committee.

◆ ACCORDING to Hon. Honoré Mercier, Minister of Lands and Forests in the Quebec Government, the wood cut on Crown Lands in the Province of Quebec this winter will probably be increased by some 150,000,000 feet board measure, over last year's cut. As a result of this additional cut, the annual report of the Department of Lands and Forests when handed down in the Quebec Legislature this month, will show that the revenue of the department for 1932 remains at the previous year's level.

◆ DR. JOHN S. BATES has relinquished his position as executive and chief chemist of Price Bros. and Co., Quebec, to accept a position with Price and Pierce, Ltd., of London, England. Dr. Bates is one of the best and most favorably known technical men in the Canadian pulp and paper industry. For several years he was superintendent of the Forest Products Laboratories of Canada at Montreal and he was largely instrumental in forming the Technical Section of the Canadian Pulp and Paper Association, of which he was chairman during the first five years of its existence. After giving up his position as superintendent of the laboratories, Dr. Bates went to Kenogami as technical superintendent and then spent some time in research and technical control work at Bathurst, N. B. After five years with the Bathurst company, he returned to Price Bros. as research engineer, and rose to his recent position of executive and chief chemist.

◆ ALEXANDER P. McKINNON, president of the A. P. McKinnon Co., Ltd., passed away in Montreal last month, at the age of 59. Born in Prince Edward Island, Mr. McKinnon was educated in the public schools and entered the employ of the International Paper Co. at Fort Edward, N. Y. Later he became associated with the Union Bag and Paper Co., in Montreal. His next move was to the St. Regis Pulp and Paper Co., of which he ultimately became woods manager for Canada and the United States. Last year he resigned this position to found his own company. One daughter, Miss Mary McKinnon, survives.

◆ MONTREAL lost one of its oldest industrialists and paper manufacturers, last month, in the person of James Robert Walker, president of J. R. Walker and Co., dealers in paper stocks. Mr. Walker, who was in his 83rd year and still took an active interest in his business, passed away suddenly at his home.

ONTARIO

◆ Hinde and Dauch Improve Earnings by Economies

With a decrease in price for its products, the operations of Hinde and Dauch of Canada, Ltd., Toronto, in the first ten months of the current year have been more active, and, through economies effected by efficient management, earnings of the company to the end of October were sufficient to meet bond interest and depreciation, whereas in 1931 a loss of $33,771 was incurred before bond interest and depreciation, which totalled $264,695. The improvement in earnings position is reflected in the balance sheet, and the company has retired bank loans of $125,000 during the year.

The very substantial improvement in earnings is due to lower operating costs and savings that have been effected by L. F. Winchell, general manager of the company, who took charge in September, 1931. Chief savings have been effected at the Trenton, Ont., plant, where 72 men are now producing 70 tons of strawboard daily as compared with 40 tons formerly produced each day by 110 men.

◆ FRED HUNT, of the Toronto sales staff of the Howard Smith Paper Mills, has been transferred to the Canada Paper Wholesale, Ltd., division of the Howard Smith organization and will operate from the same office in Toronto as heretofore.

◆ UPWARDS OF 500 colonists of the Abitibi area of northwestern Quebec stand to benefit from a decision handed down by the Quebec Public Service Commission last month, and giving prior rights to the Abitibi Power and Paper Co. to float 90,000 cords of pulpwood down feed rivers into Lake Abitibi and then southwards to the company's paper mill at Iroquois Falls, Ont., on the Abitibi River. The wood is to be purchased from settlers in the Abitibi colonization area, and the company was given exclusive traffic rights for the floating of the wood in the territorial waters about the Quebec arm of Lake Abitibi from early spring in 1933 to June 15 of the same year.

◆ GERALD T. SHIPMAN CO., Ltd., Front St., Toronto, has announced that it will be in the folding boxboard production early in the year, which will complete its lines from patent coated to chip board. The mill is at Thorold, Ont.

◆ THE SCOTT HARVEY CO., of Richmond St. West, Toronto, has been taken over by the A. D. Shoop Co., which manufactures paper boxes at its factory on Carlaw Ave., Toronto, and which will operate the former concern as a folding box division of its organization.

BRITISH COLUMBIA

◆ FORTY-FIVE dollars a ton will be the new basic price for newsprint in the Pacific coast zone next year, according to announcement by A. E. McMaster, general manager of the Powell River Co. Powell River will guarantee a maximum price of $48.50 a ton for newsprint in 1934 and of $52 a ton in 1935. Pacific Mills, the other large British Columbia newsprint producer, has also set $45 as the 1933 price. British Columbia mills are now operating 18 days a month at about 75 per cent of capacity.

NEW BRUNSWICK

◆ Maclachlan Heads Fraser Companies

At a meeting of the board of directors of Fraser Companies, Ltd., held at Edmundston on December 22nd, changes were made in the scheme of management to meet the problem caused by the loss occasioned through the recent death of the president, the late Archibald Fraser. An additional vacancy on the board had been caused through the resignation of George H. Mead, who handled the sale of the company's products in the United States through the Mead companies until Fraser Companies developed their own sales organization. All products are now being sold direct.

These two vacancies have been filled by the election of Harold Crabtree, of Montreal, and Lt.-Col. Robert F. Massie, D. S. O., Toronto. K. S. Maclachlan, who has been general manager of the company since April 1930, has been elected president. Donald Fraser, of Plaster Rock, N. B., who is a brother of the late Archibald Fraser and has been an officer of the company since its inception, continues as vice-president. Mr. Maclachlan was also elected president of Fraser Paper, Ltd., Restigouche Co., Ltd., and other subsidiaries.

A meeting of the shareholders of Fraser Companies was held recently at Edmundston and sanction was given to the creation of $2,000,000 in 6 per cent prior lien bonds, which will rank ahead of the first mortgage bonds. Sanction was also given for an increase in the first mortgage bonds from $10,000,000 to $15,000,000. There was also passed a by-law giving the directors blanket authority in carrying out the plans of reorganization.

◆ Spring Succeeds Baker as Dean of Forestry

The appointment of Samuel N. Spring as Dean of the New York State College of Forestry at Syracuse and Clyde Leavitt as Acting Assistant Dean was announced December 21 by Chancellor Charles W. Flint of Syracuse University in a talk before the student body of the college. Chancellor Flint spoke as a trustee of the college and representing a special committee of the board on the deanship consisting of the executive committee of the board, William H. Kelly, chairman, Edward H. O'Hara and Justice Edmund H. Lewis, and on which the board had asked Commissioner Frank P. Graves and Chancellor Flint to serve.

Dean Spring, who has been Assistant Dean of the college succeeds Dr. Hugh P. Baker who is leaving February 1 to assume the presidency of Massachusetts State College at Amherst, Massachusetts. Mr. Leavitt, who takes up the duties of the position vacated by Dean Spring, has been Acting Director of Forest Research at the college.

In making these appointments, the executive committee of the trustees is bringing together in the administration of the college a wide scholastic, state and federal executive experience in Dean Spring and a most comprehensive background of practical administrative forestry in Mr. Leavitt.

Professor Spring has been Assistant Dean of the college since February 1932 and chairman of the committee on graduate curriculum which reorganized the courses at the College of Forestry. He has made an exhaustive study of the curriculum looking toward the better coördination and effectiveness of training.

The new dean received the degrees of B. A. and M. F. at Yale in 1898 and 1903 respectively. He was engaged in the United States Forest Service after graduation and shortly thereafter organized and administered the forestry school at the University of Maine for two years.

In 1905, he returned to the Forest Service as a forest assistant and was soon promoted to chief of the Office of Forest Extension which dealt with reforestation in the United States. From 1909-12 he was State Forester of Connecticut and forester of the Agricultural Experiment Station of that state.

In 1912, he was member and secretary of the Connecticut Commission of Taxation of Woodlands. Professor Spring was called to a professorship at Cornell in 1912 and except for a few periods when he was on leave, has been prominently connected with the scholastic and administrative work of the Department of Forestry in The New York State College of Agriculture. He was special lecturer in forest economics at the Yale School of Forestry 1910-12 and again in 1917; he gave courses in silviculture at the University of Missouri in 1919. He traveled and studied in Europe in 1927 paying particular attention to problems of silviculture, a branch of forestry in which he is a specialist. He has served as director of the American Forestry Association and chairman of the New York State Section of the Society of American Foresters. He is author of many well-known forestry publications issued while forester of the Connecticut Agricultural Experiment Station and in the United States Forest Service and is co-author with Professor A. B. Recknagel of an important professional book entitled, *Forestry*.

Mr. Leavitt, a Spanish-American War veteran, graduated from Michigan with the degree B. A. in 1901 and the following year was assistant principal at the high school of Bellaire, Michigan. He studied at the College of Forestry at Cornell University under Dr. B. E. Fernow and graduated in forestry at Michigan in 1904 with an M. S. degree. From 1904-12 he was successively forest assistant, United States Forest Service, Chief of Section of National Forest Boundaries, assistant chief and chief of the office of organization, regional forester at Ogden, Utah and assistant forester and forest inspector at Washington, D. C.

In 1912 he became Chief Forester for the Commission of Conservation of Canada and Chief of the Fire Inspection Department, Board of Railway Commissioners.

Mr. Leavitt was appointed Acting Director of Forest Research of the New York State College of Forestry in September 1932, and has organized the Archer and Anna Huntington Wild Life Forest Station, comprising 13,000 acres in the central Adirondacks.

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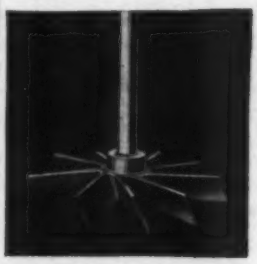

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July 1, 1932, to June 30, 1933
Scores as of November 30, 1932
24 Mills Still in Race

PERFECT SCORES
Division I—Paper and Pulp Mills

	PARTICIPANT	MILL	LOCATION
GROUP A	Hollingsworth & Whitney Co.	Algonquin & Taconnet	Winslow, Me.
	Champion Coated Paper Co.	Paper No. 2	Hamilton, Ohio
GROUP B	Champion Coated Paper Co.	Paper No. 1	Hamilton, Ohio
	Fraser Companies, Ltd.	Fraser Paper, Ltd.	Madawaska, Me.
	St. Croix Paper Co.	Woodland	Maine
GROUP C	Escanaba Paper Co.	Escanaba	Michigan
	Bathurst Power & Paper Co.	Bathurst	New Brunswick
	Ticonderoga Pulp & Paper Co.	Ticonderoga	New York
	Marinette & Menominee Paper Co.	Menominee	Michigan
	Consolidated Water Power & Paper Co.	Appleton	Wisconsin
	Cornell Wood Products Co.	Cornell	Wisconsin
GROUP D	Consolidated Water Power & Paper Co.	Biron	Wisconsin
	Port Huron Sulphite & Paper Co.	Sulphite	Port Huron, Mich.
	U. S. Gypsum Co.	No. Kansas City	Missouri
	U. S. Envelope Co.	Morgan Paper Div.	Lititz, Pa.
	International Paper Co.	Livermore Falls	Maine
	Container Corp. of America	Carthage	Indiana
	International Paper Co.	Riley	Maine
	U. S. Gypsum Co.	Gypsum	Ohio
	Hollingsworth & Whitney Co.	Abenaquis	Madison, Me.
Division II—Remanufacturing			
	Kimberly-Clark Corp.	Atlas	Appleton, Wis.
	Consolidated Water Power & Paper Co.	Stevens Point	Wisconsin
	Container Corp. of America	Natick	Massachusetts
	Bemis Bro. Bag Co.	East Pepperell	Massachusetts

IMPERFECT SCORES—Division I

	Key	Rank	Points Credit	Points Debit
GROUP A	PA-11	3	894.480	
	PA-12	4	636.944	
	PA- 7	5	548.480	
	PA-13	6	514.512	
	PB-19	7	482.160	
	PA-14	8	427.056	
	PA- 9	9	416.768	
	PA- 4	10		2,817.424
	PA- 8	11		4,261.152
	PA- 5	12		8,063.392
				799.232
GROUP B	PB- 5	4	917.840	
	PB-14	5	899.136	
	PB-21	6	896.704	
	PB- 7	7	808.016	
	PA- 3	8	782.592	
	PA- 6	9	765.776	
	PB-17	10	732.624	
	PB-18	11	654.912	
	PB-20	12	615.840	
	PA-10	13	603.808	
	PB- 3	14	566.304	
	PB-22	15	487.184	
	PB-13	16	305.072	
	PB- 8	17	143.344	
	PB- 6	18		503.456
	PB-15	19		522.928
	PB-12	20		919.200
Division II				
	RB-2	5	893.160	
	RC-1	6	544.544	
	RB-1	7	509.088	
	RD-3	8	185.440	
	RB-3	9	159.664	
	RB-6	10	18.848	
	RD-7	11	2.448	
	RC-3	12		618.032
	RA-1	13		1,530.352
GROUP C	PC-20	7	877.392	
	PC-16	8	846.384	
	PC-15	9	799.840	
	PC-26	10	712.816	
	PC-14	11	683.664	
	PD- 5	12	650.112	
	PB-16	13	572.144	
	PC- 2	14	544.048	
	PC-25	15	417.440	
	PC-17	16	385.200	
	PC-10	17	281.568	
	PC- 6	18	212.448	
	PC- 9	19	147.792	
	PC-19	20	47.792	
	PC-13	21	17.604	
	PC-11	22		111.616
	PD-14	23		327.712
	PB- 9	24		1,024.352
	PC-21	25		1,233.504
	PC- 7	26		1,405.552
	PC-22	27		2,182.000
	PC-18	28		13,199.792
GROUP D	PD-12	10	764.368	
	PC- 4	11	619.568	
	PD- 3	12	532.448	
	PD- 1	13	395.632	
	PD- 7	14	356.880	
	PD-23	15	170.752	
	PD-15	16		545.280
	PD- 4	17		730.288
	PD-21	18		957.120
	PD-10	19		1,436.080
	PD-13	20		1,695.040
	PD-20	21		2,763.264
	PD- 9	22		10,176.080
				260.538
				162.512

No November Report: PB-2; PC-1.
Withdrawn: PC-5.

◆ Paperboard Industries Revises Organization

With the approval of its members at the November 1932 meetings in New York City, the Paperboard Industries Association Organization has been established as a parent organization to serve the paperboard and box industry as a whole, and in general to conduct customary trade association activities, devoted to the general welfare of the paperboard and box industry. As now organized, it affords:

(a) A forum for consideration of subjects affecting two

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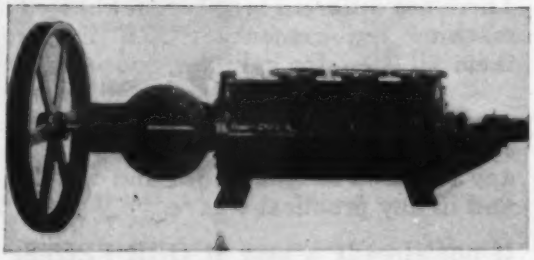

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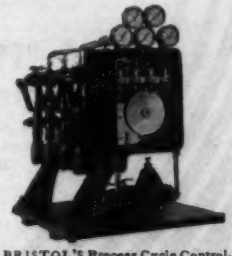

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TECHNICAL DEVELOPMENTS

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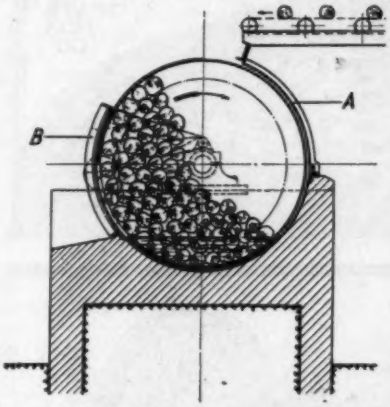
IN THE PAPER INDUSTRY ■ DOMESTIC AND FOREIGN

◆ Debarking Drums

The functions of the drums include washing the logs. Experiments were made to determine its effectiveness in this application. Various types of drums are described, including the Bache-Wiig (Norwegian) drum, the Wertheim drum, the Guettler drum, Kamyr, Hellner and Johansson drums. The Hellner drum is particularly interesting and is shown in the accompanying illustration. The logs are arranged parallel to one another



when being debarked. It is therefore well suited for processing long logs. The drum is filled about 55 to 60 per cent full of wood in operating. Four pair of such drums 2.2 meters diameter and 3.2 meters long required a total of 70 kw. Debarking took one to 1.5 hours, depending on the quality of the wood and whether it was debarked wet or dry. Filling and emptying the drums took normally 15 minutes. G. Antonoff. Wochenblatt fuer Papierfabrikation, 1932, pages 827 to 829 and 842 to 845.

◆ Corrosion in Sulphate Digesters

Distinction must be made between localized and sectional corrosion in the digester. An interesting case is cited of localized corrosion caused not by a fault in the material of the digester but by local overheating which in turn was caused by gas bubbles adhering to the metal. A protective film over the lining is formed during the digestion, and the breaking of this film or coating is claimed to be the direct cause of the corrosion. There are two kinds of such coatings: the first, a brittle coating, consisting practically entirely of crystallized calcium carbonate; the second, a denser coating, consisting of other, more or less crystalline substances in addition to calcium carbonate. The presence of a relatively high proportion of unreduced sodium sulphate in the digestion liquor favors the formation of the second coating. The brittle coating was found in the badly corroded digesters. The remedy is to remove all of the scale in case it is seen that a part has already dropped off. The wall of the digester may be painted with a zinc oxide-linseed oil paint. Kaolin, finely pulverized porcelain mass, and even good, old digester coating may be used in the place of zinc oxide in this paint. Attention is called to the necessity of avoiding too strong hammer action in feeding the steam into the digester. Too great differences in temperature throughout the digester must also be avoided if the coating is to remain on the wall. C. Benedicks. Wochenblatt fuer Papierfabrikation volume 62, year 1932, page 926.

◆ Glucose in Papermaking

It is general practice to dry rag half-stuff as well as other pulps to so-called air-dry condition before shipment in order to avoid high cost of transportation. The paper mill then has to process such dry materials in beaters which involves loss of time and increased consumption of power. Then again the strength of the rag fibers and the like is impaired by drying at high temperature. The addition of hygroscopic material of neutral reaction to the moist stock prevents the removal of the last traces of moisture in the drying operation. Even when drying is carried to extremes, a highly concentrated solution of the hygroscopic substance remains behind in the pores of the fibers. All sorts of sugars are examples of such hygroscopic substances, including glucose, invert sugar, wood sugar, sugar-containing waste liquors from the refining of beet and cane sugar as well as the sugar-containing waste liquors from glucose and dextrose manufacture. The impregnation of the pulp or half-stuff is accomplished by spraying an aqueous solution of the aforementioned saccharine materials on the pulp or half-stuff at any suitable point in the dehydrating machine before the pulp reaches the drying cylinders. The amount of sugar used must correspond at least to one-tenth of one per cent of the dry weight of the pulp. This amount of sugar has only a very slight action. In practical work, the addition of half a per cent of sugar is the minimum quantity producing any appreciable result. It is better to add 0.75 to 1.5 per cent of sugar and in some cases more, where rapid disintegration of the pulp in the beaters is desired and the strength of the fibers is to be conserved. Glucose gives excellent results, used in 1.5 per cent proportion of the weight of the pulp. Dr. Hans Wrede. Der Papier-Fabrikant, 1932, volume 30, pages 522 to 523.

◆ Speed of Newsprint Machine

The installation of suction couches and suction presses in the wire part of the machine has been mainly responsible for the increase in the speed of operation of the paper machine making newsprint. Tests carried out over a year with the new devices have proven that the output of the machine is increased 25 to 30 per cent. The author studied the effect of the height of the water column at the slice on the properties of the paper manufactured, when the quantity of diluting water remains constant; also the effect of the diluting water on the wire when the water column remains constant. The conclusions reached were that the height of the water column at the slice very largely affects the properties of the paper. The speed of mixing the paper stock caused by this height of water column should be somewhat smaller than the speed of the wire. Small changes in the correct height of water column do not appreciably affect the properties of the paper. P. Vuorisalo. Pappers—och Traevarutidskrift foer Finland, 1932, pages 670 to 677.

◆ New Beater Design

The principle on which the beater is constructed is shown in Figure 1. The bedplate is mounted horizontal to the axis of the roll. The cover is arranged

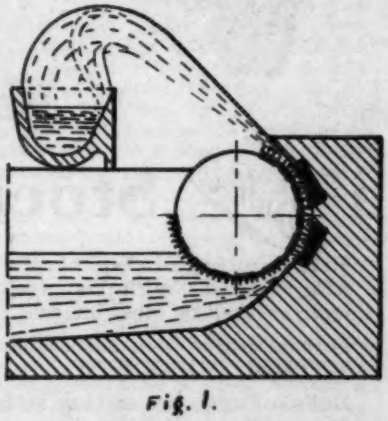


Fig. 1.

tangentially to the bedplate; the backfall disappears. Practically the entire theoretical height to which the beater roll can throw the stock is utilized in this beater. Inasmuch as the centrifugal force is dependent on the surface speed and not upon the diameter of the roll, this arrangement permits the use

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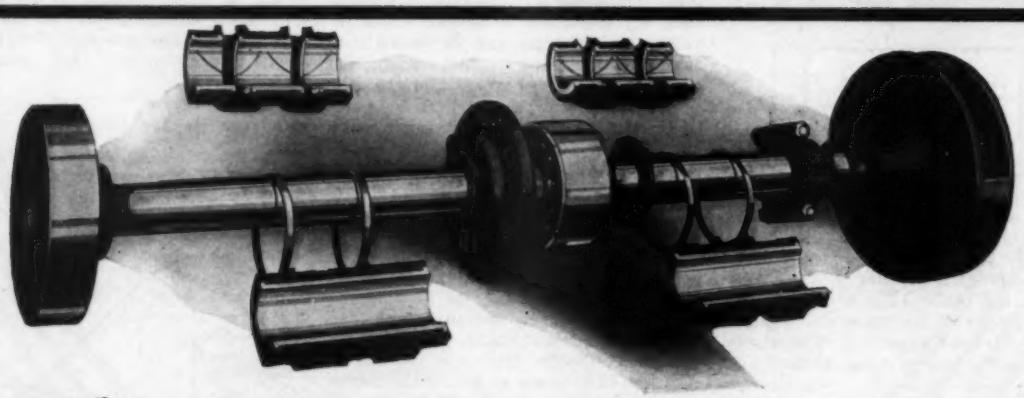

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of smaller rolls. The roll does not dip deeply into the stock and therefore the power required for driving it is reduced to a minimum. The beater vat is shown in Figure 2. It is similar to the vats in other beaters. The great height to which the beater roll throws the stock permits the return channel to be set so

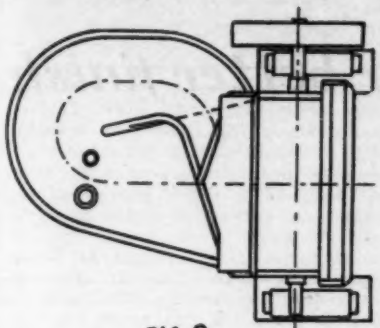


Fig. 2.

high that the stock flowing to the roll does not touch it and the roll is itself visible while at work. The tranverse return channel is placed so far from the beater roll that this can be easily taken out vertically. The vat or trough is thus easily reachable in every part for cleansing and there are no dead corners either in the trough or the cover, for the stock circulates rapidly all over. The cover is so contrived that the mixing of the stock is very efficient. The perfect mixing allows the use of very wide rolls on which the output of a beater mainly depends. Helmuth Branning. The World's Paper Trade Review, 1932, volume 98, page 1440.

◆ Chemistry of Hemicellulose of Wood

The general chemistry of hemicelluloses of wood is first described. Then they are studied from the standpoint of the presence of methoxyl groups. Hemicelluloses were prepared. The effect of the age of the wood on the hemicellulose content was also studied. The results were not conclusive and further work is required to arrive at a definite conclusion. The work is mainly a discussion of the literature on the subject and the various suggestions made by investigators regarding the origin of hemicellulose and the like. M. H. O'Dwyer. Journal of the Society of Chemical Industry, Chemistry and Industry Section, 1932, pages 968 to 971.

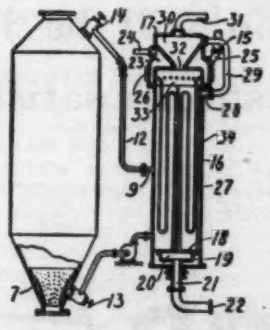
◆ Heating With Saturated and Superheated Steam

The author makes a very detailed study of the problem of heating drying cylinders and the like with superheated steam as compared with saturated steam. The thermal principles involved are depicted. Formulae are developed. The coefficient of the transmission of heat is determinative for the heating effect obtained. The coefficient for saturated steam is theoretically infinitely large, but practically it is less due to the formation of condensate. The coefficient for superheated steam (condensing) is better than that of saturated steam, inasmuch as less condensate is formed. Non-condensing superheated steam must be regarded as a gas and therefore possesses a low heat transmission coefficient. If there are places in a cylinder or the like, that are being heated with condensing superheated steam, where the pure superheat is transmitted, then the heating effect is greater than when this does not happen, and hence in any case it is greater than when saturated steam is used. G. A. Matthael. Wochenblatt fuer Papierfabrikation, 1932, pages 572 to 575.

◆ Making Pulp

The feature of the process is that the liquor is continuously concentrated during the progress of digestion. This is accomplished in evaporators, which are connected in series with the digester and through which the liquor flows. The evaporators are connected with one another in such fashion that the waste steam from one is used for heating the next evaporator in series, this taking place under reduced pressure. This method of working increases the thermal value of the waste liquors, reduces the consumption of fuel, decreases the quantity of raw materials used per unit pulp produced and also increases the yield of pulp. The apparatus used is shown in the accompanying illustration.

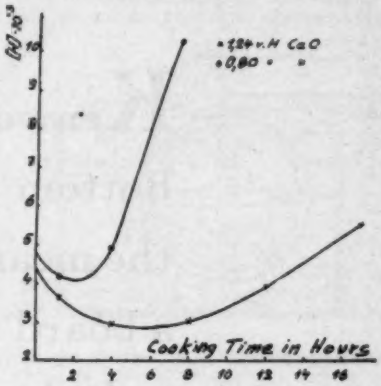
The bottom of the digester is connected through a circulating pump with the evaporator and the top of the digester is connected with the evaporator by means of the pipe (12) and the connection (9). Valves (13) and (14) are provided for regulating or shutting off these connections. A heating coil (16) is located in the evaporator. The condensate chamber (20) is connected with a pipe (22) through an outlet connection (21). Steam is introduced into the steaming chamber (23) through the pipe (24) and the waste steam is led away through the pipe (25). A number of star-shaped, partition walls (27) are arranged in the bottom of the evaporator, so that the liquor is forced to take a long path through the evaporator. The



steam from the liquor is removed through (28) and passes through the pipe (29) into the chamber (30). Unevaporated liquor passes through the opening (32) into the evaporator. The waste steam is removed from the separator (30) through the tube (31) and passes through the valve (15) and the pipe (25) into the steam chamber (23) of the next evaporator in series. Albert E. Nielsen, Oslo, Norway. German Patent No. 544,757.

◆ Hydrogen Ion Concentration of Sulphite Liquor

Hydrolysis of starch is used to test the pH coefficient during digestion. Ten bomb tubes were filled with 30 grams of absolutely dry pinewood chips and 150 c. c. of digestion liquor and were then heated in a glycerin bath with constant agitation. The tubes were cooled first in air, then in a cold mixture, and then opened. The liquor removed from the tubes was filled into strongly cooled glass bottles closed with rubber stoppers. The liquors were used to hydrolyze starch. A large number of results were obtained and are given in tabulated



form in the original article. The accompanying curve sheet shows that the pH coefficient decreased from 4.37x10⁻³ to 2.95 x10⁻³ after four hours of digestion. The pH number then rises, and after 17 hours of digestion is somewhat higher than at the beginning of cooking. When the lime content of the liquor is low (about 0.8 per cent CaO), then the pH number falls also at the start of digestion; thereafter it quickly rises. The cause is apparently the absorption of sulphur dioxide by the wood without simultaneous combination with lime. The hydrogen ions diffuse first into the wood, whereby HSO_3 anions are carried along with them. The calcium ions diffuse more slowly, apparently commencing to diffuse when solid lignosulphonic acid is formed. The hydrolytic powers of lignosulphonic acid were also determined. Sodium bisulphite pulp was prepared by cooking pinewood with five times the quantity of 18 per cent concentrated sodium bisulphite liquor at 140 deg. C. for seven hours. The yield of pulp was 64 per cent of the weight of the wood with a lignin content of seven per cent, which was determined by means of concentrated sulphuric acid. The sodium ions were removed from the pulp by washing with 0.2 normal solution of hydrochloric acid and rinsing with distilled water. The pulp, treated in this manner, was treated for fifteen hours at 80 deg. C. with distilled water. The dissolved lignosulphonic acids were

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sucked off. The normality was determined with bartya as 0.00625. The results showed that the activity of lignosulphonic acids is the same as that of strong mineral acids. E. Häegglund and A. Johansson. Svensk Pappers Tidn., 1932, page 475ff.

◆ Removing Noxious Gases

This process is concerned with the removal of the noxious gases developed during the digestion of sulphate and soda cellulose. The gases that are evolved, while the waste liquor and waste gases are worked up, are cooled down to the dew point or saturated with water, and treated with hydrocarbons of the terpene group or camphor, or with derivatives or addition compounds of such hydrocarbons, which are dissolved in aqueous alkali solutions or emulsified therein. Funnelshaped tanks are used in this process, which are called flue gas filters and which are divided into two compartments by a partition, these compartments widening out in the direction of the flow of the gas, so that the speed of the gas is reduced to a minimum. One of these compartments, or chambers, is provided with an arrangement for introducing the gas and liquid, and the other with outlets for the purified gas and with inlets for the liquor. Bror Natanael Segerfelt, Poetschmuehle, Boehmisch Krumau. German Patent No. 549,783.

◆ Paper Dried on Steam Heated Cylinders

The feature of the process is an arrangement for introducing steam into the cylinders which permits advantageous distribution of the same and the attainment of uniform heating effect. Figure 1 is a longitudinal section

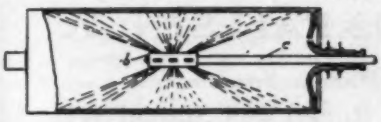


Fig. 1.

through the cylinder. Figures 2 and 3 show the details of the steam distributor. The latter consists of a fixed steam inlet pipe (c), which is carried through the hollow supporting trunnion of the cylinder and extends about half way into the length of the cylinder. A stem (a) extends through the center of the

Fig. 2. Fig. 3.

distributor and can be rotated by means of an externally-located impeller. This rod or stem is supported at the closed end of the distributor and extends a short distance beyond it. At the extreme end of the rod is a sleeve (b) which is made to surround part of the distributor (c). This sleeve can rotate around the distributor. A number of openings are arranged in the wall of the tube (c), these being shown arranged in groups as (d). There are analagous groups (e) on the sleeve (b). The rotation of the sleeve closes and opens the openings (d) in the distributor (c). This results in a very regular distribution of the flow of the steam out of the distributor (c) into the cylinder. The steam can be directed at will against different parts of the cylinder by rotating the rod (a). Aktiebolaget Karlstads Mekaniska Werkstad, Sweden. French Patent No. 730,976.

◆ Pulp Digesters

The digester has a suction sieve near the middle and pressure sieves at the top and bottom, while an interior circulation pump is connected on its intake side with the suction sieve and on its outlet side with the top and bottom pressure sieves. By controlling the current of liquid to the latter and also the supply of steam to each current, a uniform digestion of pulp is obtained. E. Moretrud. British Patent No. 377,505, filed October 14, 1931.

◆ X-Ray Examination of Paper and Pulp

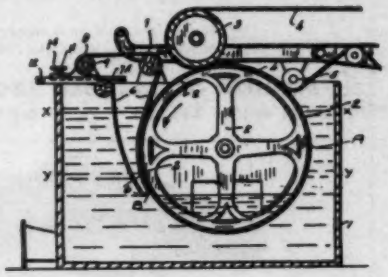
Rag and pure sulphate paper were used in the experiments to determine the relationship between hydration (beating) and various properties of the paper. All the papers were found to give reasonably good diffraction patterns with very little difference between the samples. The position of these lines is the same for both the rag papers and the pulp papers, so that there is no evidence for any change in the dimensions of the fundamental crystal cell as a result of hydration. On the other hand, the lines are clearer in the rag papers. This difference cannot be explained by the thickness of the paper. It appears to indicate that the individual crystals in the rag papers contain a larger number of crystal cells than in the case of wood pulp papers. Sulphite pulp, unbeaten, moderately beaten and wet-beaten, was examined under the x-ray. Anon. The World's Paper Trade Review, 1932, pages 1393 to 1394.

◆ Half-Stuff From Wood

The billets of wood, before being ground, are treated in wood-steaming drums first with a flow of hot air with a maximum temperature of approximately 150 degrees C. The wood is thus dried and converted into a hygroscopic condition. Directly thereafter, the wood is treated with a solution of reducing chemicals, such as sodium bisulphite or the like, the liquor being circulated through the apparatus. The concentration of these solutions is a maximum of twenty per cent. After the liquor has thoroughly penetrated the wood, and the excess liquor which has not been absorbed by the wood is removed, the wood is steamed with steam at one to five atmospheres pressure until the fibers are softened. Then the wood is washed with cold, flowing water and cooled. The billets are then ready to be ground in the usual type of wood grinder. Karl Wisshuhn & Soehne, Troppau, Czechoslovakia. Austrian Patent No. 126,587.

◆ Forming Paper on Cylinder Machine

The new process consists essentially in preventing the formation of a film from a suspension of paper fibers and water at the dip side of the cylinder over such a stretch of the circumference of the same that the weight of the film or layer is less than what is required to cause the layer of fibers to loosen and strip from the cylinder before reaching the point at which the layer is normally removed. This makes possible any desirable increase of the density of the stock, without there being any danger that the layer is prematurely stripped from the cylinder surface. The illustration shows an apparatus for carrying

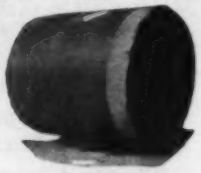


out the process in a cylinder machine which is covered at the dip end by a removable felt.

The container is shown at (1), which is filled with a suspension of fibers and water up to the line (x—x). A cylinder wire (2) revolves in the container (1). The couch roll is shown at (3). The felt is shown at (4) and is carried over a press roll (5) and the couch roll (3). The arrangement is such that the felt comes into contact with the top of the upper part of the cylinder. The cylinder wire (2) is covered at the dip side by means of an endless felt (6); for example, up to the point (B). The surface of the felt (6) lies against the surface of the cylinder and covers the latter at the dip end over the stretch (x—B). The endless felt (6) is led around a fixed roll (7) and an adjustable roll (8). By changing the distance between the rolls (7) and (8), the magnitude of the stretch, over which the felt (6) contacts with the surface of the cylinder, is adjusted. The shafts (9) of the adjustable rolls (8) are journalled in bearings, which are fastened to an adjustable base plate (11), which is movable in the guides (12) and which can be adjusted by means of the set screws (14) and (15). Sigurd Norman. German Patent No. 556,005.

◆ Bark as Fuel

The literature on the subject of the utilization of waste bark and chips for fuel is reviewed. Tables are given showing the heating value of various woods and waste materials obtained in



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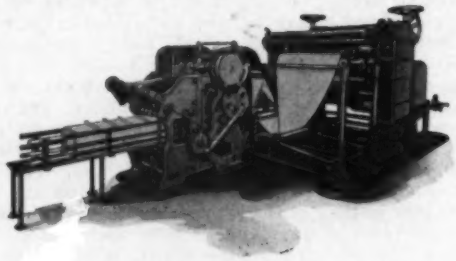

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working up wood into pulp. The effect of the water content of the wood on its heating value is also indicated. Apparatus for removing the moisture are described. The article contains a number of references and is valuable to those interested in this subject. Dr. A. St. Klein, Zellstoff und papier, 1932, pages 326 to 328.

◆ Rosin Sizing

The new theory abandons the idea of films of rosin. The process of engine sizing is a surface tension effect which begins by hindering and ends by preventing the capillary forces existing between the water and the fiber surfaces from drawing water into the paper. The theory is illustrated in the accompanying diagram. In Figure 1 are shown two adjacent fibers of cellulose

free from impurities. The surface tension of the water necessarily causes it to penetrate or spread. Figure 2 represents the sized condition of the fibers. It shows what happens when one or two particles of the size are present on the fibers. The penetration of water is hindered. The essential function of the sizing process is, therefore, to produce a sufficiently water-repelling precipitate in a very fine state of division and in spreading it uniformily over the fiber surfaces. The mechanism of the reaction between rosin size and alum is discussed. The different sizability of various pulps is explained by the fact that the force tending to draw water into a sheet will vary as the exact surface condition alters. Any small amount of water-repellant substance in the fiber surface will alter the angle of contact and in general will make the fiber more easily sized than pure cellulose fibers are. The angle of contact would appear also to be changed by changing the degree of beating of the fiber, although many other conditions lessen the ease of water penetration in wet-beaten pulp. In addition to all these factors the area of surface to be protected by the size per unit weight of fiber is different in different types of fibers. Edge. The World's Paper Trade Review, 1932, volume 98, pages 1427ff.

◆ Filled Paper

The process is concerned with the manufacture of rosin-sized paper filled with alkaline filler. Such a paper can be satisfactorily sized with rosin if the filler, the alum, or a mixture of the two, is added to the diluted pulp just before it reaches the paper machine. Alternatively, the size, alum, and filler may all be added at this point. Other variations are possible so long as the time of contact of the filler with the size-alum complex prior to sheet formation is reduced to a minimum. Raffold International Corporation. British Patent No. 378,024, filed May 1, 1931.

◆ Easy-bleaching Pulp

An easy-bleaching pulp is obtained from wood and other cellulose-containing and lignin-containing fibrous materials by treating these materials in the moist state with chlorine and thereafter in the presence of a strong mineral acid, which decomposes the cellulose-chlorine-lignin compound. This process is preferably carried out in the presence of the hydrochloric acid which is formed during the action of the chlorine on the original materials, or after the removal of part of the acid, the cellulosic material is treated with an organic solvent, miscible with water at a high temperature. Methanol, ethyl alcohol and acetone may be used as such solvent. Operating at an elevated temperature allows hydrolytic splitting of the chlorinated lignin from the cellulose and dissolving out of the incrustating substances to be accomplished in a single operation. Hence, a white, lignin-free pulp is obtained in a single operation without there being any need of after-treatment. Contrary to opinion, the treatment of the cellulose fibers at high temperatures and in the presence of a strong acid neither destroys the fiber nor weakens it. Dr. Oskar A. Mueller, Zuerich, Switzerland. German Patent No. 552,481.

◆ Mixer for Stock Density Regulator

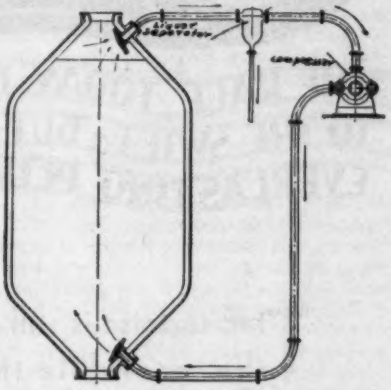
The stock or pulp density regulators used at the present time in the pulp and paper industry depend for their accurate operation principally on the mixing of the water with the pulp-water mixture being accomplished as thoroughly as possible and as quickly as possible directly at the regulator itself. This is because the stock regulated in density by the addition of water acts on the effective part of the regulator. In the new arrangement the mixing of the pulp and water is affected in a mixing chamber located directly in front of the regulator. The feature of the device is that a rectangular mixing chamber of large diameter, which is connected to the stock inlet pipe, is narrowed down again to a pipe width directly in front of the branch pipe leading to the regulator. Thus the cross-sectional area of the mixing chamber becomes smaller as it nears the regulator and finally narrows down to a small diameter pressure pipe. The increase in the velocity of the flow of the stock is responsible for the better mixing of the water with it. Gustav Kaemmerer, Osnabrueck, Germany. German Patent No. 551,386.

◆ Evaporating Waste Liquors

In order to evaporate liquids, it has been proposed to distribute hot gases through a perforated bottom and to conduct the hot gases, emerging through the perforations, through the liquor that is to be evaporated. The perforated bottoms, which have been hitherto used for this purpose, are made of stoneware, whose pores are naturally irregular in size. Hence, the flow of gas through the same is irregular and the speed of flow varies. According to the invention, the gas is driven with a speed that remains as constant as possible through a layer of liquid which rests on a perforated bottom provided with perforations arranged uniformly over its surface. These perforations are all of the same size. The result of such treatment of the liquid with the gas for evaporating purpose is that a layer of gas bubbles is formed over the perforated bottom. These bubbles all have the same size, so that their contact surface forms a flat plane. Industrikemiska Aktiebolaget, Stockholm, Sweden. German Patent No. 553,967.

◆ New Sulphite Digestion System

The illustration shows a sulphite digester with a new system of circulating the digestion liquor. The gaseous sulphur dioxide, which is formed during the digestion process, is drawn off at the upper end of the digester and is passed through



a device in which the liquor, that is carried along mechanically, is precipitated. Then the gas is passed through a compressor and pumped into the digester at the lower end. This very simple arrangement is claimed to allow digestion with weaker liquors than usual and with the production of good quality, uniform pulp. The circulation of the liquor through the digester is very effective by this process and the digestion is finished in shorter time than usual. Ramen. Zellstoff und Papier, 1932, page 365.

◆ Electrical Calender Drive

The use of a new form of alternating current commutator motor is discussed. Its advantages are outlined and the characteristics of its operation are shown. One of the important advantages is that the regulation of the motor extends over the entire range of calender drive with practically no loss. The efficiency is high and the power factor favorable. The operation of the calender rolls is markedly improved by the use of this motor. Lorenz Kiessling. Der Papier Fabrikant, 1932, volume 30, pages 469 to 473.

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◆ THE THIRD Packaging Exposition will be held March 7, at Hotel Pennsylvania, New York.

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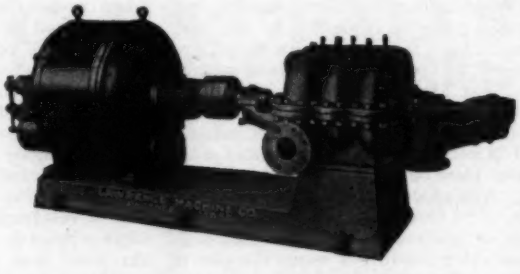

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The COMMERCIAL OUTLOOK

New York, January 3, 1933.

YEAR-END quietness has been very pronounced in the paper market in recent weeks. Demand for practically every class of paper and paperboard has decreased appreciably; not only has the market experienced the customary slowing down coincident with the holiday and approaching inventory periods, but it would appear as if the shrinkage in paper business has been somewhat greater than ordinarily is seen at this season. Reflecting the uncertainty and slowness of general business, consumers and converters of paper have confined their buying chiefly to bare requirements, and it has been very evident that their needs have run well under normal from a quantity standpoint.

The paper industry, similar to nearly all manufacturing industries, is suffering from a further decline in consumption of its product. Business in all its branches has been disappointing in the pre-holiday season; retail trade has registered a sharp falling off, while activity in the wholesale markets has decreased to a point which in all likelihood establishes a new low level for the depression. More and more it is growing apparent that the very bad effects of the foreign debt situation and the action, or lack of definite action, of political leaders in Washington are not alone delaying the much-desired improvement in general business but are making for even more severe conditions in avenues of trade for manufacturers, distributors, jobbers and others to contend with. In short, business in the last few weeks has, from a general standpoint, not become any better; instead it has been growing worse, and not because of any material change in the fundamentals controlling business but chiefly because of a further shaking of the confidence of the American public.

What lies ahead is difficult indeed even so much as to surmise. There are those, within and without the paper industry, who feel that the advent of a new year, bringing with it new hopes and in all probability renewed confidence, will inaugurate better times. Certainly, from many viewpoints business enters 1933 with greater promise of a turn for the better than was the case a year ago. Financial and banking conditions have improved substantially during 1932; the financial structure of the nation is on a much sounder basis today than twelve months ago, and, this being so, it seems but logical to expect that general business will register—even though slowly—gains of a more or less constant nature. What is most needed above all other things, it is commonly acknowledged, is something that will instill confidence in the consuming and buying populace, something that will afford greater security to that bigger portion of the country's population that still have jobs, are working and earning, and have money to spend. Put these millions of people in a different frame of mind, it is believed, and demand for commodities and manufactured articles in general will increase at a rapid rate and lead to a rapid expansion in business.

Numerous instances have come to notice in recent weeks of an additional contraction in the consumption of paper of various grades. This, of course, has resulted in a falling off in orders received by paper mills, and in most cases paper manufacturers have found it necessary to curtail production—and in some mills to no small extent. Consumers, converters, jobbers and all others have seemingly had one objective in mind, that of keeping their inventories down to as low a level as feasible, and very few have taken advantage of the attractively low prices that have prevailed in most quarters of the paper market on nearly all classes of paper and board. "Let the future take care of itself; meanwhile we will go into the new year with stocks down as low as we can reduce them"—this has been the acknowledged attitude of paper buyers.

Production of newsprint during November in the United States and Canada showed a gain as compared with the preceding month. Mills in the United States produced 81,662 tons and shipped out 83,922 tons, against 76,731 tons and 76,922 tons, respectively, in October, while Canadian production was 161,334 tons and shipments 164,327 tons, contrasted with 157,506 tons produced and 157,568 tons shipped in October, making a combined total of 242,996 tons produced and 248,249 tons shipped in November, compared with 234,237 tons produced and 234,490 tons shipped during the preceding month. During November, 21,195 tons of newsprint were manufactured in Newfoundland and 844 tons in Mexico, so that the total North American output for the month amounted to 265,035 tons, against 256,076 tons in October.

Production of newsprint in the United States in the first eleven months of 1932 aggregated 928,799 tons, or 134,849 tons less than the total of 1,063,648 tons in the similar time of 1931, a decline of 13 per cent. Output in Canada in the eleven-month period last year was 1,770,424 tons, a decrease of 283,984 tons or 14 per cent from the 2,054,408 tons manufactured in the corresponding 1931 period, while the total North American production in the first eleven months of last year reached 2,961,104 tons, a decrease of 441,392 tons or 13 per cent from the total of 3,402,496 tons produced in the same time of 1931. Stocks of newsprint at U. S. mills at the end of November were 30,581 tons, and at Canadian mills 45,461 tons, giving a combined total of 76,042 tons, compared with 81,295 tons a month before.

Paperboard production in the United States increased sharply in October contrasted with the preceding month, a total of 202,351 net tons being manufactured in October by 122 mills, against 181,545 tons in September last and 218,157 tons in October, 1931, according to the monthly summary of the board industry compiled by the U. S. Department of Commerce. Board production in October last was at 61.4 per cent of mills' rated capacity, against 57.3 per cent in the preceding month and 63.7 per cent in the similar 1931 month. Shipments of board from mills during October aggregated 204,447 tons, or slightly in excess of the current output, and compared with 189,230 tons shipped in the preceding month. New orders called for 202,892 tons, against 205,568 tons in September, and stocks at the end of October amounted to 72,142 tons, compared with 74,237 tons a month before.

In some divisions of the market a fairly steady price tone is observed; in others, a condition bordering onto chaotic prevails. It is no secret that paper manufacturers in some cases have striven hard recently for orders; they have been eager to keep their mills running at as brisk a pace as the market would justify, and have not hesitated to reduce prices in their scramble for orders. Buyers, realizing the situation existing, have resorted to a good deal of "shopping" around the trade seeking supplies at the lowest prices, and under such circumstances with sellers pushing for business and buyers pressing for concessions, prices have suffered to no little degree.

The newsprint price basis is believed settled for 1933, although there have been rumblings of this or that manufacturer shading prices a bit more to secure contracts. One of the encouraging features in the price situation is the maintenance of mill quotations on paperboard. Eastern manufacturers are quoting $30 per ton for newsboard and $27.50 for chipboard delivered in New York City and other consuming centers, and show no disposition to digress from these price levels. Fine paper prices are relatively steady, more especially on the high grade lines of rag content, though some of the cheaper priced sulphite bonds are reported selling at new low prices. Tissue paper is unsettled in price, and wrapping is still a problem from a price standpoint.

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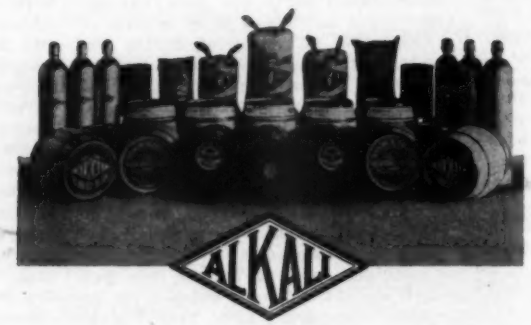

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Domestic RAW MATERIALS

◆ Papermaking Rags

With consuming demand at an exceptionally low ebb, dealers in at least some cases eager to effect sales, especially of late while endeavoring to reduce stocks for inventory purposes, and available supplies well in excess of the wants of buyers even though production and collection of most grades of rags is far below normal, the market situation in papermaking rags is entirely in favor of those on the buying side. It is a buyer's market, from just about every angle. However, buyers appear to be taking little advantage of the condition prevailing, and are in a great majority of instances keeping almost completely out of evidence as purchasers.

The doleful market position of rags for papermaking is traceable to one all-important factor, which is that consumers are using rags in such limited quantities at present they can hold aloof from the market, with the result demand from consuming quarters is so slow and narrow that it can be said scarcely a sales outlet of importance exists and buyers have everything in their favor when acquiring needed supplies and in the prices they have to pay to cover their restricted requirements. Yet there seems no doubt that were mills' requirements larger and demand nearer to normal volume, prices of rags would be substantially higher than they happen to be, and that with any spurt of consistent buying it would not take long to clear the market of accumulations of stock and put rags in a decidedly stronger statistical position.

Dealers point out that it has now been two years or longer since the production and collection of rags started on the downgrade, and meanwhile the output of new cotton and linen cuttings and new rags in general used for the manufacture of paper has decreased to a degree where no more than 40 per cent of the tonnage formerly produced is now becoming available, while the gathering of old rags has declined to a like extent. Moreover, importations from European and other foreign sources have steadily diminished month by month, as shown by Department of Commerce figures. Therefore, while the consumption by paper mills has decreased sharply, it is contended that the supply of rags has shrunk in almost similar proportion, and many in the trade insist that the technical position of rags is nothing as poor as it appears at present while consuming demand is so slight.

The case of some grades of new cotton cuttings is cited as an apt example of this situation. Production of cuttings for months past, it is asserted, has been at a very low level; clothing manufacturers have experienced poor market conditions and have reduced their operations to the proverbial minimum, so that rag merchants have received but minor lots of cuttings from supply sources. Dealers declare that purchases of only a few carloads of almost any one grade of new cuttings would virtually clean the market bare of supplies, and that further supplies would not be available, at least for some time. Thus, it is claimed, market prices in all likelihood would rise quickly and sharply were demand to revive.

Definite prices hardly exist in the current market. There are quotable ranges on the different grades of rags, but in the absence of transactions establishing market values, prices are principally nominal. No. 1 new white shirt cuttings are reported available at 4 cents a pound f.o.b. dealers' shipping points, and perhaps at less than this price. Old No. 1 white cottons are approximately 2.50 to 2.75 cents a pound, repacked old thirds and blues 85 cents per hundred pounds, and roofing stock 45 cents a hundred for No. 1 and 35 cents for No. 2 packing, f.o.b. shipping points.

◆ Rope and Bagging

Paper manufacturers are engaging in very little buying of old rope and bagging and prices of these materials are tending lower. No broad changes have been registered but the current spotty buying is mostly at the low edges of quotational ranges, with No. 1 scrap burlap bagging reported available at around 70 cents a hundred at shipping centers, No. 1 domestic gunny bagging at 85 cents, and roofing bagging at 30 cents. Old rope prices rule relatively steady at 1.50 cents to perhaps a trifle lower per pound for No. 1 domestic old manila, and an average of 1.35 cents ex dock New York for No. 1 foreign old rope. Stocks in the hands of dealers are said to be low, and much resistance to any further drop in prices is noted, but these circumstances have little import with consuming demand as limited as it is.

◆ Pulpwood

Demand for pulpwood is quiet, indications pointing to pulp manufacturers being more intent on disposing of their product than to adding to their raw material supplies. Prices are irregular and uncertain, and at best easy of tone.

◆ Old Paper

The old paper market has quieted very perceptibly since the early part of December. As is their usual wont, paper and board manufacturers let down in their purchasing as the close of the year approached, and, reflecting the much slower consuming demand, prices have moved downward. The market in the Middle West has held up relatively better than in the East, prices in New York and other eastern cities having sagged fairly sharply. Packers are quoting the high grades rather steadily, asking 1.65 cents and higher per pound at shipping points for No. 1 hard white shavings, 1.75 cents for hard white envelope cuttings, and 1.50 cents for No. 1 soft white shavings. Old kraft paper has declined to where purchases at 65 and 70 cents per hundred pounds f.o.b. eastern centers have been recorded.

◆ Mechanical Pulp

Many consumers of mechanical pulp bought fairly heavily several months ago, or back in September and October, and meanwhile the market has turned very quiet with prices following a declining course. Reports regarding Canadian groundwood are most unfavorable; it is said that some producers in the Dominion are eager to effect sales of pulp they have on hand and are seemingly overlooking the matter of price in their efforts to secure orders. Canadian groundwood is said to be obtainable in some exceptional cases at $13 per ton at pulp mills across the border, although the quotation more commonly named is $15. Domestic groundwood is nominally $17 to $18 a ton at grinding centers, though so little tonnage of pulp is being sold by domestic manufacturers in the open market that scarcely any business is being transacted in this branch of the trade. Foreign groundwood of Scandinavian origin is relatively steady in price, owing to mills abroad being well sold up temporarily, it is stated.

◆ Chemical Pulp

A decidedly unfavorable, if not disconcerting, market prevails in chemical wood pulp, from the standpoint of the producer of pulp. There is little demand of consequence emanating from consuming quarters. Most paper and board mills not only have ample stocks of pulp on hand but also have sizeable supplies on order, and have let down in further purchases to a degree where they are engaging in almost no buying. Pulpmakers are doing what they can to sustain market price levels in the face of very discouraging market circumstances, yet any changes reported from time to time are invariably in a downward direction. Bleached sulphite of prime grade is on a quotable basis of 2.10 cents a pound ex dock Atlantic seaboard, though purchases are reported possible at well under this level. Domestic unbleached sulphite is in a price vicinity of 1.50 cents a pound f.o.b. pulp mills, domestic kraft pulp around 1.50 cents at producing points, while bleached soda pulp is selling at 2 cents a pound delivered book paper mills.

◆ Chemicals

Contract quotations on papermaking chemicals for 1933 show few changes, though the alterations made have been nearly all downward. Paper mills are reported buying sparsely at present. Bleaching powder is 1.75 cents a pound at works; caustic soda 2.55 to 2.60 cents for the solid product, soda ash 1.30 cents in bags at works, and sulphur $18 to $20 per ton at mines.

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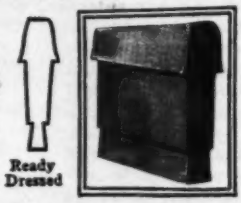

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Import and Export MARKETS

IMPORTS

◆ Wood Pulp

The market for wood pulp has quieted to a pronounced degree, and with paper and board manufacturers holding aloof as buyers while evidently having ample supplies on hand or on order and while indisposed to add to their stock or commitments during the holiday and inventory period, the price condition has become very irregular. In fact, it might be said the slowing down of consuming demand has led to something of a chaotic situation in market prices. Producers abroad are striving to maintain quoted rates on a steady level, but it is an open secret that pulp is being offered on this side at sharp recessions in price and that sales have been recorded in some instances at prices well under those recognized as prevailing quotational bases.

Resale or consigned lots of chemical pulp, as ordinarily is the case at the end of the year, have come into the market with their owners pressing to sell, and the result is that those consumers who have been in the market to buy recently have not had to meet established price levels but have acquired the supplies desired at attractively low costs. By way of example, the quotational basis on prime bleached sulphite is 2.10 cents per pound ex dock New York and other American Atlantic ports, yet there have been reports of sales down to as low as 1.75 cents. Similarly, strong unbleached sulphite of foreign origin, quoted at 1.60 cents ex dock, is said to have been bought at 1.30 and 1.35 cents. Perhaps the sulphite secured by buyers at these low prices has been resale lots, and perhaps its quality has not been strictly prime, but the fact remains buyers have been able to get pulp at such low figures, and since it is difficult in these times to persuade buyers to grant other than the low market prices in any commodity, paper manufacturers have been intent on purchasing the pulp wanted at bottom market costs.

Pulp producers in Scandinavia held a meeting in Stockholm in late November, at which, according to advices reaching the United States, a merry little verbal battle developed. As is known, the Scandinavian manufacturers have established sales prices on chemical pulp for export to American consumers, and at the recent conference accusations flew thick and fast against the pulp producers present that they had not lived up to the prices agreed upon. The upshot was the acknowledgement that all the manufacturers had digressed from the basic prices, and after the meeting had calmed down it was voted to continue sulphite prices on unchanged levels of 2.10 cents for prime bleached and 1.60 cents for strong unbleached landed American Atlantic ports. Sulphate or kraft pulp producers in Scandinavia later met and reduced the basic price on prime unbleached kraft from 1.50 cents to 1.25 cents landed U. S. ports. Late advices tell of the Swedish mills proposing a price range on sulphite covering the several qualities, as for example three different quotations on unbleached sulphite with 1.60 cents suggested for the No. 1 grade, 1.50 cents for the No. 2 grade and 1.40 cents for the No. 3, though no decision has been reached.

The movement of imported pulp from Europe to the United States keeps on a fairly large scale, judging from last official U. S. Government statistics covering the month of October. However, it is customary for pulp imports into this country to rise as the year-end draws near, this being a seasonal matter as Swedish shippers endeavor to get pulp out prior to the Baltic freeze-up. The October importations of chemical pulp, totaling 106,824 long tons of a declared value of $3,956,281, were the largest in any previous month last year with the exception of January and February, comparing with 70,351 tons of a value of $2,689,919 in September, and 102,897 tons of a value of $4,499,339 in October, 1931. October imports brought the total for the first ten months of 1932 up to 887,224 long tons of chemical pulp, giving a monthly average of 88,722 tons, contrasted with 984,287 tons for a monthly average of 98,428 tons in the similar period of 1931. Groundwood imports in October were 15,961 long tons, valued at $274,074, against 15,658 tons of a value of $295,539 in the preceding month, and making a total for the ten months of 1932 of 130,140 tons, valued at $2,578,725, against 148,958 tons of a value of $3,675,223 in the corresponding time of 1931.

◆ Paper Stock

Imports of rags for papermaking into the United States in October last, according to official figures issued by the U. S. Department of Commerce, amounted to 7,386,391 pounds, valued at $110,696, compared with 4,225,980 pounds of a declared value of $63,617 in the preceding month, and making a total for the first ten months of last year of 69,601,674 pounds, valued at $950,070, contrasted with 102,030,623 pounds of a value of $1,377,771 in the similar period of 1931. Imports of miscellaneous paper stock, including old rope, bagging, etc., were 5,310,762 pounds of a value of $60,160 in October, against 8,951,460 pounds of a value of $82,366 in September last, and bringing the aggregate for the first ten months of 1932 up to 74,388,211 pounds.

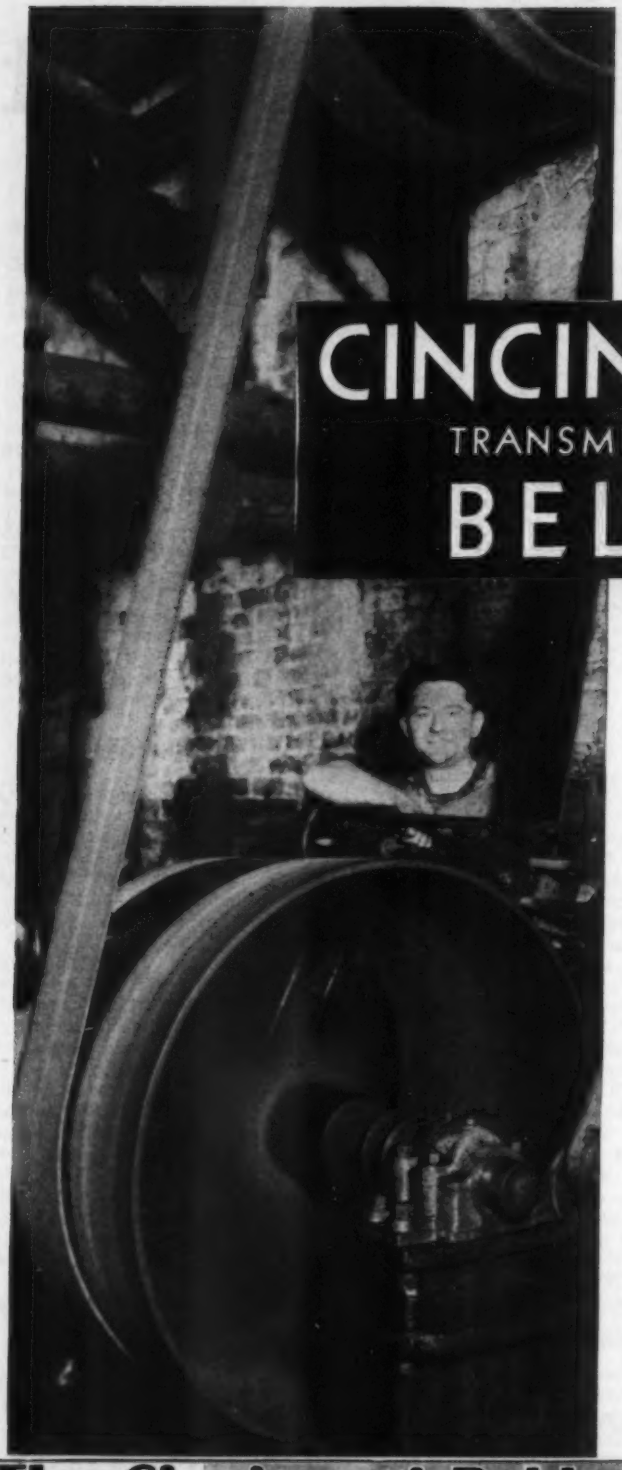
◆ Paper

Imports of paper into the United States in October reached a value of $7,371,339, comparing with $6,996,141 in the preceding month and $10,660,077 in October, 1931, according to U. S. Department of Commerce figures. In ten months last year, imports totaled in value $80,331,406, showing an appreciable decrease from the $105,950,179 worth of importations in the corresponding period of 1931. Newsprint comprised the great bulk of these imports, the receipts of such paper in October being valued at $6,771,367, against $6,322,677 in the preceding month, and $9,545,187 in October, 1931.

EXPORTS

Exports of paper and paper products from the United States continued to decline during October, official statistics issued by the U. S. Department of Commerce placing exportations in that month at a value of $1,114,493, compared with shipments of a value of $1,118,852 in September last and $1,748,643 in October, 1931. The October exports made a total for the first ten months of 1932 of $13,138,953, constituting a sharp recession from the shipments in the corresponding period of 1931 valued at $19,121,970.

Exports of newsprint paper were valued at $42,615, against $58,443 in the same 1931 month. Wrapping paper shipments dropped from a value of $161,405 in October, 1931, to $83,411 in the similar month last year, while writing paper exports decreased from $102,022 to $65,507. Book paper exports in October last were valued at $51,584, compared with $71,692 in the same month in 1931, and sheathing and building paper shipments were valued at $9,600, against $19,597 in 1931. On the other hand, tissue paper exports increased from a value of $38,300 in October, 1931, to $53,067 in the same month last year, and exports of overissue newspapers climbed from a value of $104,487 to $112,107 in the same months. Boxboard exports were of a value of $25,191 in October last, against $64,650 in the previous October, and other paperboard exports were valued at $78,990, contrasted with $133,740 in 1931. Exports of paper bags were valued at $37,198 last October, against $63,514 the year before, and paper box exports were of a value of $38,208, compared with $72,331 in October, 1931.



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Shafts (Collapsible)
Cameron Machine Co.

Sheet Metal (Annealed)
American Rolling Mill Co.

Sheet Metal Work
J. O. Ross Eng. Corp.

Sheets (Iron & Steel)
American Rolling Mill Co.
J. T. Ryerson & Son, Inc.

Sheets (Stainless Steel)
American Sheet & Tin Plate Co.

Shower Pipes
Beloit Iron Works
F. W. Roberts Mfg. Co.
Smith & Winchester Co.

Silent Chain Drives
Link-Belt Company

Silicate of Soda
Grasselli Chemical Co.

Slitters
Cameron Machine Co.

Slitting & Rewinding Mach.
Beloit Iron Works
Cameron Machine Co.
Hudson-Sharp Mach. Co.
Samuel M. Langston Co.
Smith & Winchester Co.

Soda Ash
Diamond Alkali Co.
Grasselli Chemical Co.

Special Machinery
Beloit Iron Works
Hudson-Sharp Mach. Co.

Speed Reduction Units
Link-Belt Company

Sprockets
Link-Belt Company

Stainless Steel Sheets
American Sheet & Tin Plate Co.

Starch
Corn Prod. Refining Co.

Steam Meters
The Bristol Co.

Steel (Bars, Shapes, Plates, Sheets, Etc.
Joseph T. Ryerson & Son

Stock Cutters
B. F. Perkins & Son, Inc.

Stokers
Westinghouse Electric & Mfg. Co.

Stuff Pumps
Beloit Iron Works

Suction Boxes
Beloit Iron Works
Pusey & Jones Corp.

Sulphite (Strong Bleached & Easy Bleaching)
The Borregaard Co., Inc.
Perkins-Goodwin Co.

Sulphur Burners
American Paper Mach. & Eng. Works
Glens Falls Mach. Works

Supercalenders
Holyoke Machine Co.
B. F. Perkins & Son, Inc.

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The Bristol Co.

Tank Lining (Rubber)
B. F. Goodrich Rub. Co.

Tanks & Vats (Wood)
New England Tank & Tower Co.

Tensile Strength & Stretch Testers
B. F. Perkins & Son, Inc.

Testers (Bursting Strength)
B. F. Perkins & Son, Inc.

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Holyoke Machine Co.
Pusey & Jones Corp.

Thermometers
The Bristol Co.
Taylor Instrument Co.

Toilet Machine (Hard & Soft Roll)
Hudson-Sharp Mach. Co.

Towel (Interfolding Machine)
Hudson-Sharp Mach. Co.

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J. T. Ryerson & Son, Inc.

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Marion Malleable Iron Wks.

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General Electric Co.
Westinghouse Electric & Mfg. Co.

Turbines (Hydraulic)
Holyoke Machine Co.

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Crane Co.

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B. F. Goodrich Rub. Co.

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Wm. Powell Co.

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Crane Co.
Wm. Powell Co.

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General Electric Co.

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Wm. Powell Co.

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Wm. Powell Co.

Valves (Quick Opening)
Wm. Powell Co.

Valves (Relief)
Wm. Powell Co.

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J. O. Ross Eng. Corp.

Ventilating Fans
B. F. Perkins & Son, Inc.

Ventilating Systems
J. O. Ross Eng. Corp.

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Glens Falls Machine Co.

Water Wheels
Holyoke Machine Co.

Weight Governor
Paper & Industrial Appliances, Inc.

Wet Machines
Downingtown Mfg. Co.
Glens Falls Machine Wks.
Smith & Winchester Co.

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Downingtown Mfg. Co.

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Downingtown Mfg. Co.
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J. T. Ryerson & Son, Inc.

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Link-Belt Company

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the Irish Free State, bearing
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NEWFANE, NEW YORK

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WHEN in need of any information within the scope of the PAPER and PULP MILL CATALOGUE, you do not need to play hide and seek in order to find it.

¶ Each section is arranged to permit the data within it to be located quickly and easily, as every section is printed on paper of contrasting color to the section following or preceding it. In this way it is possible to turn to any of the several sections without hesitation, once familiar with the color scheme.

¶ Study the catalogue which is available to you in your mill. Familiarize yourself with its sectional arrangement. Then save time through using it at every opportunity.

» » » Address all communications to the « « «

PAPER AND PULP MILL CATALOGUE

333 N. Michigan Avenue, Chicago, Illinois

Is *Your* Safety Program Paying *Maximum* Dividends?

DURING the 1931-32 Paper Industry Safety Contest, nine paper, pulp, bag and container mills completed the 12 months' period *without a single lost-time injury*—an aggregate of two and one-half million man hours worked safely. These mills furnish nine perfect illustrations of the maximum dividends to be reaped from a successful safety program.

Similarly, in the Paper and Pulp Section of the National Safety Council, 100 companies that have reported experience over a five-year period can point to a reduction of *one-half* in accident frequency and severity rates, as the dividends paid by their safety programs.

In 1933, every company in the industry should follow the lead that Safety offers to reduce accident costs. The National Safety Council will gladly outline, without obligation upon request, the methods any company can adopt that will result in this desired cost reduction.

National Safety Council

INCORPORATED

20 North Wacker Drive Chicago

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IN HIGH CLAY P...

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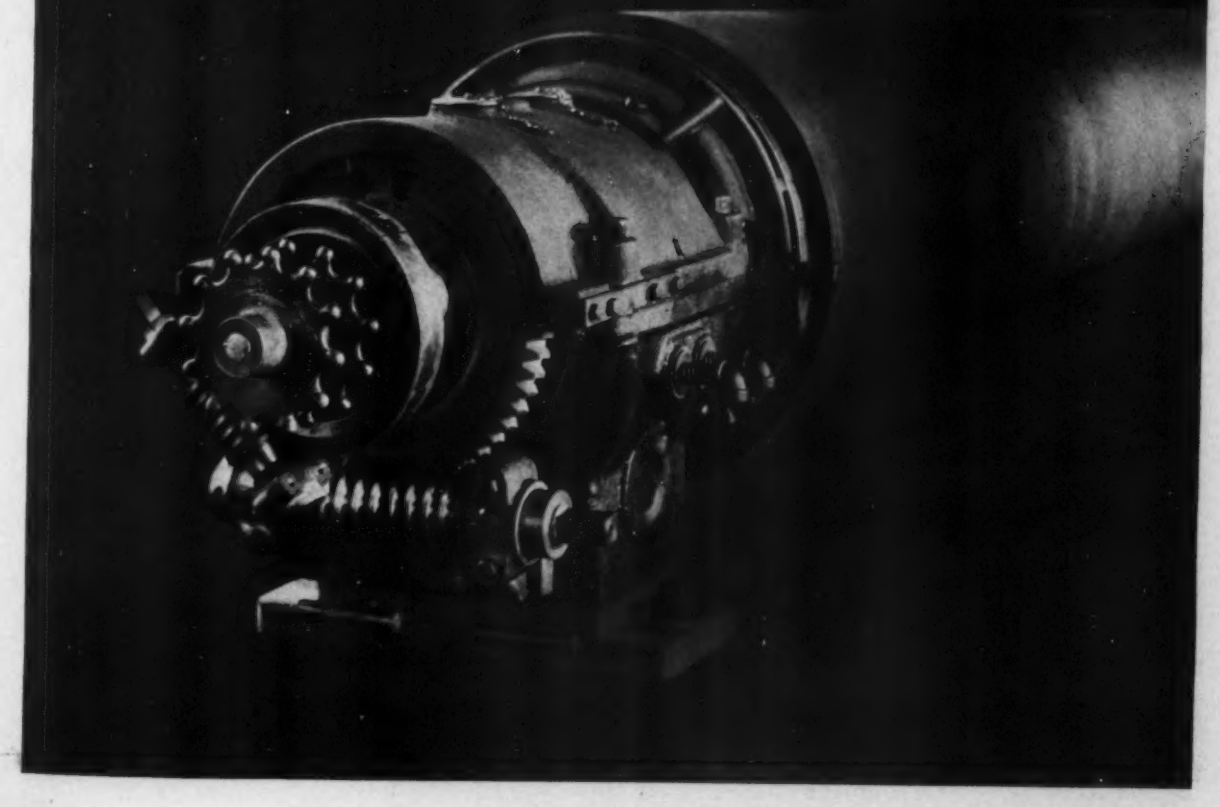
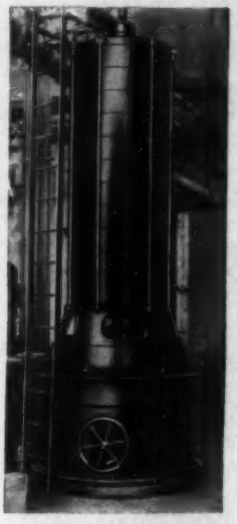


87 Tons in 24 Hours



THE Research Engineer of one of the best known paper manufacturing companies in this country recently visited a mill where a FRITZ VERTICAL HYDRATOR is at work. After making a thorough investigation he reported:

> *I asked many questions about the* FRITZ VERTICAL HYDRATOR *and heard nothing but favorable reports concerning it. They told me they were putting their entire production from their pulp mill through it (87 tons of bleached sulphite in 24 hours) and then had to beat the pulp 1½ hours, and by this procedure they got a 20-30% increase in bursting strength.*

Before using the Hydrator this mill was only able to handle 72 tons daily, keeping the stock in the beaters 3½ hours. By using the Hydrator the mill was able to increase the production 15 tons daily and saved two hours' time on 87 tons' production, or in other words, the machine is saving 174 beater hours daily (or eight 1800 lb. beaters) and at the same time making a better sheet of paper than by other methods, using only 85 hp. to do all of this work.

A happier as well as a more profitable New Year will be realized by the use of this machine throughout 1933.

Paper manufacturers who want to make a better product and at the same time cut costs are invited to write us.

◆ ◆ ◆

LOVE BROTHERS, Incorporated

Aurora, Illinois